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ADVANCED MANAGEMENT

Quarterly Journal

*The Society for the
Advancement of Management*

ARTICLES IN THIS ISSUE ON

Administrative Decentralization
Controlling Salary Expense
Time in Manufacturing
Job Evaluation
Industrial Self-Government
Cost Reduction
Management and Organized Labor
Price Levels and Prosperity
How to Write Numbers
What's Wrong with Accounting

January, February, March, 1940

Vol. V, No. 1

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ADVANCED MANAGEMENT

Quarterly Journal

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COMMENT

NEW legislation which represents a marked departure from previous practices takes time to get itself assimilated into the thinking and operation of those who must work with it. The more novel the measure, the longer and more profound is the process of assimilation. It is therefore not to be wondered at that the working of the National Labor Relations Act should continue to be the subject of managerial scrutiny, of congressional inquiry and of a public balancing of the pros and cons.

This is not the place to carry forward this discussion in particular terms. Whether or not the act should be amended, what might be the character of such amendments,—these are matters for the fullest and freest weighing by every citizen.

But irrespective of what may fairly be called the legalistic aspects of this whole issue, there remain numerous phases of the problems of joint dealing which, in any event, require thinking through in other terms—in terms of managerial attitudes and aims, of operational processes and procedures, of all the ways and means of building up relations between managers and workers which do in fact lead to common concern for uninterrupted production, low costs, good quality and amiable dealings.

This issue of *ADVANCED MANAGEMENT* contains a number of articles which are positive and creative in their examination of this troubled area. They look at real difficulties squarely, but with the effort to work through them to genuine, common and public benefits—and from the point of view of management's concern and possible effectiveness. The discussion by Messrs. Cooke and Murray is especially significant in this connection. For here two representatives of different functional forces in society explore a common basis of action.

The substantial agreement reached by these two authorities coming at the problem of how to increase productivity under joint machinery and collaboration of management and men, represents a landmark in the thinking on this topic. It is of further significance to record that the entire volume from which the colloquy is drawn was distributed free to all the twenty-four hundred delegates to the recent convention of the United Mine Workers of America. Perhaps some management association will now follow suit and distribute this tract for our times to its members!

In his article Mr. Tead suggests why it is that industries operating as administrative units seem to be the inevitable resultant of present forces, and to be also

the logical agencies for autonomous control required by growing awareness of the need for constitutionalism in industry. Mr. Webster also directs attention to the need for action on an industry-wide rather than individual-company basis.

Indeed, the statesmanlike analysis of methods of decentralizing the responsibilities for managing agencies of national dimension, which is offered by Mr. Lilienthal, further sharpens the view that in collective negotiation, as in other aspects of directive duties, there has soundly to be a balancing of national and local influence, voice and participation.

In all matters of this kind legislation can never be, nor should it ever be, the substitute for good will, for applied intelligence and for sustained attention to problems of human dealing. For in such matters the will to reach agreement and to carry out that which is agreed is the basic requirement. Given that will, the next step is experimentation to discover those procedures which will bring good results in the specific situation.

It is to be hoped that this issue of *ADVANCED MANAGEMENT* contains suggestions which may help forward solutions to the non-legalistic aspects of the problems which the Wagner Act has thrust to the fore in the thinking of us all.

While the forward-looking manager is considering his employee relations, he has, however, to be mindful constantly of other aspects of internal operating effectiveness. He is challenged by competition and by new research and tested experiment to consider, for example, his procedures of Cost Reduction, Economy in Manufacture, Salary Determination and Job Evaluation. New and important articles on these subjects will be found in this issue under the authorship of Harold B. Maynard, Franklin G. Moore, Edward N. Hay and Kent F. Bradbury.

Taylor and Gilbreth would have valued the suggestion contained in Mr. Mascarich's article, of a system of numbers for Time Study Engineers. This is the kind of idea that should stimulate valid differences of opinion.

The article on "What's Wrong with Accounting" in our last issue brought forth a response from Mr. Wilcox which is reproduced here in accordance with our established policy of giving a hearing to all informed contributors to the discussion of complex problems.

Administrative Decentralization of Federal Functions

An Experiment

By DAVID E. LILIENTHAL

Director, Tennessee Valley Authority, Knoxville, Tennessee

DURING the past decade this democracy has come to far-reaching decisions concerning the responsibility of the national government for the welfare of all its citizens. For the first time the Congress has defined the duty of the Federal Government with respect to unemployment. It has legislated on minimum wages and hours, on social security and old-age pensions. National policies on agricultural production have been adopted and the public will has been expressed in Federal legislation on a variety of subjects close to the lives of every man and woman in the country. The long and arduous struggle to secure national recognition of national problems in these new fields is now behind us. But fresh engagements lie ahead. For as new problems grow to national proportions the people of this country must grant further powers to their central government. The trend is unmistakable; it cannot be denied.

The granting of additional responsibilities to the national government has been a victory for clear thinking. But the delegation of the necessary powers is not enough; those powers must be effectively administered. And many people, among whom I count myself, in government service and in private life, are deeply troubled on this score. We feel that methods and procedures must be developed to make certain that the *administration* of these essential national functions shall not become so concentrated at Washington, so overpowering in size and so distant from the everyday life of ordinary people as eventually to undermine confidence in all governmental activities.

There is a sound distrust of bigness and of remote control in this country. Business has felt the force of this revulsion against overwhelming bigness and remoteness; some of our wiser business leaders are experimenting with methods of halting that trend. And in the field of government thoughtful men in this administration recognize that distrust of bigness and of excessive centralization applies also to the administration of public powers. For in spite of our triumphs over time and space, Washington is still remote from the average citizen and is sheltered from participation in his day-by-day struggles.

A central government is bound to suffer from lack

of knowledge of local conditions, of parochial customs. In a country as vast as ours, in which local and regional differences are so vital and so precious, we must recognize that powers centrally administered from the national capital cannot take into account the almost incredible range of physical and economic variations within our boundaries. Also, excessive centralization of administrative authority at the national capital causes interminable delays in arriving at decisions and putting them into effect in the field. When every recommendation, each regulation, and even requisitions must all be submitted for examination, approval, and action at headquarters nothing can be done very promptly; and delay in the field not infrequently spells defeat for a program.

When laws fail to be effective, when through ignorance of local conditions or the slowness of their operation they do not realize their purposes, that is bad enough in itself. But a more disastrous sequence threatens. A democratic government must retain the confidence of the people for whose welfare it must act. When confidence is replaced by uneasiness, fears develop that the granting of further powers may be abused. Ridicule at the apparent ignorance of some government officials takes the place of pride. Democracy cannot thrive in an atmosphere of scorn or fear. One of two things ultimately happens. Either the distrustful citizens refuse to yield to the national government power which it should have, or an arrogant central government imposes its will by force. In either case the substance of democracy has perished.

The Dilemma of the Need for Strong Central Powers and the Ineffectiveness of Over-centralized Administration

This is our dilemma. Let us concede that if this democracy is to survive and be effective today, its citizens must entrust the Federal Government with increasingly larger powers to deal with emerging social and economic problems. Only a hopeless antiquarian can ignore the significance of advancements in communication and transportation, the new mobility of our population, and the swift contagion of our once local problems. It is folly to contend today that questions of public health, of child labor, of food supply, are matters for purely local control. State boundaries no longer

shelter reasonable economic and social units. Most of the agitation against centralization of authority in the Federal Government in the name of "States' Rights" is spurious. It comes from those whose selfish economic aspirations require an impotent central government for their fulfilment. And there is genuine peril if the powers of the Federal Government are hopelessly out-distanced by the trend to centralized control in industry and commerce and finance. We must have a strong, vital, responsive central government. Yet the dangers of centralized administration are all too evident. They cannot be ignored.

Decentralization in Administration Proposed as One Answer

The remedy for the evils of over-centralization does not lie in limiting the authority of the Federal Government by refusing to grant it needed powers. The answer must be found in improving the methods by which those increasing essential national powers are administered. For I believe it will be discovered that whenever there is honest fear and valid complaint against Federal authority, the difficulty lies, not in the grant of power, but in the way in which it is exercised.

The question simply stated is this: How can these necessary and long delayed grants of power in the field of economic and social welfare be administered by the Federal Government so as to avoid the dangers and limitations of over-centralized administration? How can a democracy enjoy the advantages of a strong central government and escape the evils of remote, top-heavy central administration of the details of economic life? In my view, the *decentralized administration* of Federal functions which lend themselves to such technique, and the *co-ordination in the field of such decentralized activities* is by all odds the most promising answer.

Centralized Government and Centralized Administration Need not Be Synonymous

Not a few of our difficulties have arisen because we have accepted, uncritically, the notion that centralized administration is an inevitable consequence of a grant of power to the central government. That is simply not true. Yet that is the position commonly accepted, not only by the average citizen, but by writers on political science and administration. Their discussions of the problems of centralization are usually concerned exclusively with how much power should be given to the central government, not how those powers should be translated into action and made part of the daily lives of men.

More acute observers have seen the distinction. About a hundred years ago our institutions were studied at first hand by the French statesman and writer De Tocqueville. No one has ever put the matter more clearly than he. In his famous work, *Democracy in America*, he pointed out the difference between the two in the following language:

Certain interests are common to all parts of a nation, such as the enactment of its general laws, and the maintenance of its foreign relations. Other interests are peculiar to certain parts of the nation; such, for instance, as the business of the several townships. When the power which directs the former or general interests is concentrated in one place or in the same persons, it constitutes a centralized government. To concentrate in like manner into one place the direction of the latter or local interests, constitutes what may be termed a centralized administration.¹

This difference between *governmental centralization* and *administrative centralization* is fundamental. Governmental centralization in this sense will inevitably continue. Probably it will increase. Administrative centralization, on the other hand, has recognized hazards, and I believe the trend must be reversed without delay. I venture to suggest that unless administrative centralization is inhibited, a reaction against granting further central powers, essential to a functioning democracy, will inevitably follow. De Tocqueville's conclusions are significant and should be heeded. He said:

... Indeed, I cannot conceive that a nation can live and prosper without a powerful centralization of government. But I am of opinion that a centralized administration is fit only to enervate the nations in which it exists, by incessantly diminishing their local spirit. Although such an administration can bring together at a given moment, on a given point, all the disposable resources of a people, it injures the renewal of those resources. It may insure a victory in the hour of strife, but it gradually relaxes the sinews of strength. It may help admirably the transient greatness of a man, but not the durable prosperity of a nation.²

The TVA as an Experiment in Decentralization

Learning how to decentralize the administration of centralized authority cannot be achieved by abstract thinking. Experimentation is required. Methods must be tried out, improved here, abandoned there.

It is of one contemporary experiment I wish to speak—the Tennessee Valley Authority—the boldest and per-

¹ De Tocqueville, Alexis, *Democracy in America*, translated by Henry Reeve and translation revised by Francis Bowen, John Allyn, publisher, Boston, Volume 1, page 108.

² *ibid.*, page 109.

haps most far-reaching effort of our times to decentralize the administration of Federal functions. If it succeeds, if its methods prove to be sound, we shall have added strength to the administrative defenses which protect the future of our beleaguered democracy.

The powers of the TVA are, of course, national powers. The seven-state watershed drained by a single river system presents a variety of problems with which the separate states and localities acting alone are unable to deal. Obviously the control and conservation of the water resources of a great river system, to serve alike the needs for flood control, navigation, and water power, are tasks which only the Federal Government, with its broad powers, is in a position to undertake. If this job was to be done in the Tennessee Valley, a Federal agency or agencies had to do it.

So the TVA was inaugurated. The problems of a region were viewed as a *single problem* of many integrated parts, rather than dissected into separate bits in order to fit the pigeonholes of existing governmental instrumentalities. This thesis of integration led Congress to vest no single function of the Federal Government in the TVA, but rather substantially all of the Federal interests in the region as they related to the control of natural resources of water and land.

The "Grass Roots" Administration in Action

For six years now the TVA has been making a conscious effort to push its administration farther down into the "grass roots." It has adopted many methods used by other public and private agencies. It has done some pioneering.

It has set out to reach certain administrative goals. The TVA Board of Directors believes now that out of our experience we can offer these goals as *the essential characteristics of a decentralized administration of Federal functions*.

1. A decentralized administration is one in which the greatest number of decisions is made in the field. Therefore the field officers must be selected, trained, and supervised with a view to increasing their capacity to decide questions on the ground. They must be able to understand the broad, general policies, and to adapt them to varying local situations. An over-centralized administration, in public or private business, is always characterized by the fact that its field officers tend to become messengers and errand boys. Talent, recognition, and remuneration stay at the center where responsibility is concentrated. Administration can never be decentralized that way.

2. A decentralized Federal administration must develop as far as possible the active participation of the people themselves. It must utilize the services of State and local agencies, supplementing and stimulating, not duplicating, their staff or equipment. The Federal Government must give leadership, but its job should be to encourage the participation of local agencies in establishing basic national standards. It cannot be content with compliance.

3. A decentralized Federal administration must co-ordinate in the field the work of State and local governments, aiming toward common objectives. The statute of the TVA encourages it likewise to co-ordinate and to integrate the activities of other Federal agencies operating in the area. In highly centralized administrations the co-ordination is at the top. Delays result in the field, jealousies develop, jurisdictional disputes are magnified. In a decentralized administration the co-ordination must be in the field.⁸

These three objectives, in TVA's experience, become the distinguishing goals of a decentralized administration. Let me describe, by way of illustration, the way in which our agricultural program has developed, using methods characterized by the administrative objectives I have listed.

TVA's Agricultural Program as an Illustration of "Grass Roots" Administration

The Authority inherited a wartime factory at Muscle Shoals which it was directed to use for experimentation in the production of plant foods to conserve the nation's exhausted soil. It was further directed to conduct demonstrations on the soil in the use of the fertilizer thus produced, and to engage in a program of soil conservation. On the advice of experts it was decided to devote the plant to the production of new and more efficient forms of phosphatic fertilizer. As soon as our laboratories produced the new material in sufficient quantities for testing purposes, written agreements were executed with the agricultural experiment stations associated with the land grant colleges in each of the seven Valley states, all local institutions of long standing and familiarity with local conditions. Each experiment station agreed to test the new types of plant foods under conditions of scientific control and observation. For this purpose, the TVA did not set up its own testing equipment, nor develop a huge staff. It used local facilities already in existence. And when the tests

⁸ See Marshall E. Dimock, "Executive Responsibility," *The Society for the Advancement of Management Journal*, 22, 28, January, 1938.

yielded adequate technical data, a program was developed to test and demonstrate the new products under practical farming conditions. To accomplish this result TVA made agreements with the agricultural extension services of the same land grant colleges. So, in a steady march toward the "grass roots," the TVA began its program of co-operation with the farmers themselves. This is the way that testing is being done in the field today.

The county agricultural agent, himself a combination Federal, State, and local official, calls together the farmers of the community and explains the testing program, and its relation to soil fertility and rural conservation. The farmers themselves then select the farm of one of their neighbors to be used as a demonstration unit. The selected farm is mapped and inventoried, and the necessary changes in his farm management are made by the farmer-operator with the advice and assistance of a local committee of his neighbors, the county agent, and if necessary, the college itself. The farmer agrees to carry out the program, to keep the necessary records, to report the results, and to pay the transportation costs of the phosphatic fertilizer the Authority contributes.

Each test-demonstration farm becomes a community enterprise. Neighboring farmers visit the test farm and watch the results; sometimes as many as a hundred farmers and their families join in a single area-wide enterprise. A meeting of one of these communities is a refreshing experience for anyone who is oppressed with the sterility of some types of "expert" activity and stodgy "reports"; or to those who despair of the reserves of vitality of the democratic process.

On September 1, 1939, after six years, there were 26,532 farms in twenty states co-operating in this demonstration program. Each farm was the center of a group of participating farmers varying from fifteen to 125; a total of about three quarters of a million farmers actively engaged, in their own neighborhoods, in carrying out a national program. There were 4,290,007 acres of land in twenty states under a controlled program of soil conservation under community auspices. *Every one of those demonstrations was planned, organized, conducted, and, to a large extent, financed by the farmers in the community.* The Extension Service provides information and leadership in setting up the organization and supervising the record-keeping. The TVA provides the plan of procedure, the fertilizer materials, and funds for assistance in organization and supervision. But there is no imposing of regulations designed in some remote headquarters. Perhaps it is

fortunate that although the TVA has large authority it has, in this field, no *powers* in the political sense. We cannot compel compliance with any of these plans. There is no penalty for non-co-operation. The contracts between the Federal Government and groups of its citizens are voluntarily entered into. We must cherish this participation of the people if our program of rural rebuilding is to go forward.

How Special Problems Can Be Diagnosed and Remedied by the "Grass Roots" Technique

It must be remembered that the hard problem in any soil conservation program is its application in the field. Experts know now how to restore and conserve the fertility of the worn-out land. Time and money will do it on millions of acres. If, as fortunately is not the case, the government owned all the land, it would be easy. The point is that conservation must be carried on on lands owned by individual farmers, who are using the land to make a living. At a distance it is too easy to forget that a farmer who joins a national program of soil rebuilding is asked to forego a part of his cash income when he sows his land to cover crops for a season. For the farmer whose family must be fed and educated on a slender margin, this may mean a major dislocation of his personal budget. He may be eager to join for the good of his community and his country, but the problem he faces is how to increase the revenues on a part of his land so he can protect the soil on the rest.

The TVA set out to do something about this problem of fitting a general program to individual needs, of making self-interest and national interest in soil preservation more nearly synonymous. Some way had to be found to help the individual farmer to raise his income on the land it was wise for him to use for production.

The men on the ground, technicians or laymen, can see these individual problems most clearly and be of most use in solving them. A decentralized grass-roots structure of program is in a position to receive plans and recommendations from the field. Such specific recommendations were made to TVA and were promptly accepted. We early learned from the field, for example, that the soil conserving program could never be widely adopted in the South unless new ways to raise farm income were discovered and demonstrated. TVA's budget was not big enough to do that whole job, nor was it desirable for the Authority to duplicate facilities and staffs already assembled by other agencies. Another set of voluntary agreements was negotiated.

These experiments in practical methods of agricultural readjustment have been undertaken under a Memorandum of Understanding between the United States Department of Agriculture, the TVA, and the State agricultural colleges, and under separate contracts with the engineering colleges of the Valley states. Additional agreements have been made with groups of citizens, and with industry.

Under these agreements inventions, experiments, and studies have gone forward. The results range from the design of inexpensive farm machinery and equipment and demonstrations of community refrigerators, to the development of a new process for the quick freezing of berries and fruits. Every development assists the farmer to plant more of his land to soil conserving crops, increases his income, and tends to accelerate the readjustment in his farm management necessary if the soil of this country is to be saved. The necessity for every one was discovered by the men in the field; their use is promoted by them as the general program is adapted to local needs.

So far as it is possible at this stage to judge the results of a long-time campaign such as a rural conservation program must necessarily be, we believe such methods are getting results. The people affected are participating to a remarkable degree. We are using existing agencies of all kinds to the fullest extent; our practices are being adapted and modified to meet local conditions. Decisions are made in the field by a staff chosen and trained for that responsibility. It is decentralization in fact. The future must be the judge of whether those methods are effective to do a Federal job.

A Decentralized Power System

I have chosen the TVA agricultural program to discuss in some detail because its impact on the habits and lives of our fellow citizens is so immediate and so obvious, and because there can be no dispute about its national importance. Electricity service touches our lives directly, too, and TVA today is experimenting in the decentralization of the operations of a power system. The contrast here is between the methods of private and public business, but the principles are the same.

Through the medium of the public utility holding company, the business of generating, transmitting, and distributing electricity has developed into one of the most highly centralized industries in the United States today. The Commonwealth and Southern Corporation, for example, prior to the sale of its Tennessee electric properties last summer, controlled in every detail the

fortunes of a vast power empire extending over eleven states, and thereby touched the daily lives of hundreds of thousands of people. The management of the entire system was highly centralized, and questions of policy and many of the every-day problems of operation were determined, not by the state and local managers, but the New York headquarters of the holding company.

Nowhere is the fear of bigness for bigness' sake and distrust of control from a far-off place better exemplified. Some years ago, in urging decentralization in the utility field, I wrote that public confidence in the utility industry was impaired by this very fact of overpowering size and remoteness of control.⁴ I believe that is true today.

Now of course a degree of centralization in a power system produces certain economies which cannot be effected in any other way. I have long been convinced, however, that a decentralized administration can be achieved with distinct social gains and without impairing the efficiency of the service. We are trying it out in TVA. The power program of the Authority constitutes the first large-scale American demonstration upon which the country can judge. We believe that we have centralized the only activities in connection with electricity supply which are common to a large integrated area and must be carried on by a single agency, that is, generation and transmission. In our system those responsibilities are centralized. They are carried on under the control of the TVA itself. On the other hand, the ownership and management of the distribution systems are decentralized. The decision to participate or to remain outside the region-wide power program was made voluntarily by each community. Ownership and responsibility for those municipal and co-operative systems which deliver the power directly to the consumers who live in the cities, farms and villages are lodged with the people themselves.

Already the Authority is supplying power at wholesale rates to approximately one hundred separate and independent distribution areas. Thirty of these are operated by co-operatives, and the remainder by municipalities, two of which give county-wide service. Federal standards laid out in the TVA Act are maintained by means of provisions in the Authority's wholesale power contracts. Substantial uniformity of basic policy among its retail electricity distributors prevails on such important matters as rates, account classification, distribution of revenues, and payments in lieu of

⁴ "Holding Companies and the Public Interest," *Reports of the American Bar Association*, 808, 818 (1932).

taxes. But the ownership and the ultimate control of the local electricity distribution systems are vested in the people themselves, who in a measure determine their own standards of service, and reap the benefits of efficient operation through lower rates.

This example of decentralization is particularly impressive, we believe, because as is well known it is in the *distribution* of electricity that the greatest economies are possible; there is the real yardstick. And yet that is the part of the work entrusted to local agencies, not to TVA. The dividends of such decentralization are already appearing, not merely in high returns in cash to these community systems—returns in excess of 15 and even 20 per cent on investment are being reported—but dividends of other kinds, even more significant socially. I invite your study of the effect of these added responsibilities of operating an essential public service upon the level and tone of city management generally in communities where TVA power is being distributed; the effect upon the evils of patronage in city services, of slipshod accounting, and of lack of citizen interest in municipal affairs.

Bringing electricity back to the people has tapped resources of local pride, ingenuity and friendly rivalry with other communities that may mean more to the Tennessee Valley a decade hence than even the billions of cheap kilowatt hours. The fruits of decentralization may prove to be rich indeed.

The TVA Offers its Methods for Exploration by Students of Public Administration

I have described only two of its activities as examples of the methods TVA is using. Similar techniques characterize its entire program and the TVA Board believes it can safely assert that it is administering a Federal program at the grass roots. We are giving Federal leadership, advancing national standards. But it is not so simple a job as is sometimes imagined. And it is important not to be deluded by half-way schemes. A decentralized administration is not necessarily inaugurated when a Federal department opens a regional

office, although most of us have become so reconciled to the inevitability of Washington as the sole seat of Federal functions that even such a procedure seems a startling innovation. But unless that regional office is staffed by persons of the stature and training to command respect, and unless they have had delegated to them authority and discretion to adapt the national program to local conditions, it is not decentralization. It may simply be efficient and often costly centralization. Until decisions are made in the field there is no real decentralization. That is the heart of it. A wholly new point of view must be developed. Statutes must be so framed as to make decentralized administration possible. Administrators must be determined to delegate power to men in the field. A new conception of Federal personnel is involved, an emigration of talent to the grass roots. We must get over the notion that a new staff, every one paid out of the Federal Treasury, must administer every detail of each new Federal law. Existing local agencies can be used. Their facilities are ready and available for many tasks. To duplicate them is not only extravagance, it denies local participation. The job of the Federal government should be to accelerate, supplement, co-ordinate their programs in the field.

I hope students of government will explore the methods of TVA. They may not be suitable for other regions, or to solve different problems. Diversity will characterize a decentralized Federal program just as surely as uniformity is the mark of centralization. We must improve our procedures. They are developing techniques. I hope therefore that TVA's efforts toward more effective administration will be the subject of critical scrutiny.

We talk a great deal about our devotion to democracy in America these days. But words, however eloquent, will not save democracy. We must make it work or it will die. To make it work calls for every resource of intelligence, persistence and openmindedness we can summon. It is in this spirit that the TVA experiment in regional decentralization is being carried forward.

The Compa-Ratio

A Means of Control of Salary Expense

By EDWARD N. HAY

Personnel Officer, The Pennsylvania Company, Philadelphia

MANAGEMENT seeks two things in dealing with the problem of salaries. The first of these is control of salary cost and the second is the maintenance of employe good will. A common method of dealing with salary cost control is through the budget. The budget principle, alone, however, is not effective for this purpose because the budget is merely a forecast, which in turn is based on two more fundamental factors.

The first of these factors in salary cost control is the number of positions that must be filled in order to accomplish the task at hand. The second factor is the salary value of each of these positions. Salary cost control is, therefore, not an accounting or budgetary problem and it must, as has been indicated, be broken down into its two separate parts.

Continuous control over the number of authorized positions is ordinarily maintained in a large organization by a systems or methods department. Under a plan of functional organization, a systems department reporting to the controller has access to the methods of every part of the office organization and by a study of each element of the work is able to determine not only the "one best method" but also the number and kind of persons necessary to do the required work.

The appropriate salary for each authorized position is first determined by a plan of systematic salary classification. This is a function which commonly belongs with the personnel department but in the absence of a strong personnel department may perhaps be a division of the controller's department. Throughout this discussion only salaried positions in the general office are being considered although the principle applies to salaried positions throughout the organization.

Under a plan of systematic salary classification each position is assigned to a salary grade with a minimum and a maximum salary. The accuracy of these control limits, or maxima and minima, depends in large degree upon the refinement and effectiveness of the particular method of salary classification that is used. The most highly developed method of salary classification is no

doubt the factor comparison method described in recent articles.¹

We have seen that salary cost control divides itself into two parts. The first of these, the number of authorized positions, is controlled by the systems division of the controller's office. The second, or the salary grade appropriate to each such authorized position, is controlled by the salary classification set up usually by the personnel department.

There has, however, been a need for some unit of measurement that is universal in its application and which will permit comparison of the level of cost between units, or in the same unit from one period of time to another. To meet this need I propose the "compa-ratio." This unit is the result of comparing actual salaries with standard salaries, the resulting ratio indicating the level of present salaries in comparison with such standards. The nature of the unit indicates the source of the word coined to describe it, compa-ratio. This unit was conceived independently by Mr. Samuel L. H. Burk of the Atlantic Refining Company, whose company also employs the factor comparison method of salary and wage classification. It is not safe to make such cost comparisons against salary standards derived from less accurate methods of salary and wage evaluation.

The following steps illustrate the calculation of the compa-ratio for any given department or division of the business. Salary classification requires a careful study of each position and results in its assignment to the appropriate salary grade. Each such grade has maximum and minimum salary limits. For example, in our organization, investment stenographer, Position No. 709, has been assigned to a grade which has a minimum salary of \$79 per month and a maximum of \$105 per month.

The "standard salary cost" for any position I will

¹ Bengé, Eugene J., "Gauging the Job's Worth," *Industrial Relations*, Vol. 3, Nos. 2, 3, 4, Feb., Mar., Apr., 1932.

Burk, S.L.H., "A Case History in Salary and Wage Administration," *Personnel*, Vol. 15, No. 3, February, 1939.

Hay, Edward N., "Arranging the Right Pay," *Personnel Journal*, Vol. 17, No. 10, April, 1939.

"Planning for Fair Salaries and Wages," *Personnel Journal*, Vol. 18, No. 4, October, 1939.

now define as the median salary value of that particular salary grade; for example, the mid-point between \$79 and \$105.

In the factor comparison method of salary classification, all relationships are geometric. For example, the maximum of any grade is found by multiplying the minimum by 1.33. Consequently, the geometric mid-point of a grade is found by multiplying the minimum by the square root of 1.33. The theory behind this need not be discussed at this time.

To find the standard salary cost of any department, therefore, it is necessary only to add the minimum salaries authorized for every position in that department and multiply the sum total by the square root of 1.33.

The next step is to add the actual salaries of these same positions and to compare them with the sum of the mid-points, the calculation of which was just described. These mid-points we have called "standard cost," or "par," or "bogey." The actual salary cost is compared with this standard or par by dividing par into the actual figure and multiplying by 100. Figure I illustrates the method of calculation. The result, 102.1, is the compa-ratio for this particular department.

TABLE I

	Minimum	Maximum	Present Salary
Smith, Jennie....	79.	105.	79.
Boon, Vera	79.	105.	87.
Jones, Alice	94.	126.	115.
Doe, Thomas	149.	198.	190.
Gray, Eleanor ...	66.	88.	78.
Smith, Harry	105.	138.	125.
	572.		674.
	1.154		
	<u>2288</u>	660) 674 (102.1	Compa-ratio
	2860	660	
	572	1400	
	<u>572</u>	1320	
	660.088	800	

The compa-ratio of 102.1 for this department shows that salaries are slightly above par, or in excess of standard cost. The meaning of this is somewhat more clear when it is realized that the lowest compa-ratio which a department can have without having actual salaries below aggregate minimum salaries for those particular positions is 86.6 and the highest 115.4. A compa-ratio of 102.1, therefore, is rather close to par or standard cost.

In our organization, the first calculations produced a compa-ratio of 125.2 for one of the older depart-

ments of the company. A detailed examination revealed the cause to be repeated increases in salary without reference to any standard and with less regard for individual merit of employes than for length of service. This illustrates the value of the compa-ratio as an indication of salary costs that are out of line. In the same manner, abnormally low salaries are sometimes revealed. This, of course, is a dangerous situation because of possible employee dissatisfaction, aside from the unfairness.

I have described how the compa-ratio is used to indicate the level of salaries prevailing at a given time in any department. It can also be used to compare the level of salaries in one department or plant of the business with others. In doing this, since it is a unit based on one hundred for standard salary, the comparison is a fair one regardless of the size of the departments involved. Table II illustrates the comparison among different plants of a large business.

TABLE II

Plant A.	112.1
Plant B.	102.3
Plant C.	97.6
Plant D.	101.0

Plant A would seem to have somewhat high salaries and a breakdown showing the compa-ratios of the different departments of that plant would reveal where salaries are most out of line, thus affording a means of correction. Likewise, the low ratio of Plant C would justify inquiry which might reveal unduly low salaries at some point.

The compa-ratio can also be used to compare the differences in salary levels in the various departments of the same organization. The high figure for the service department shown in the illustration in Table III is due to the steady employment and long service of employes in that department.

TABLE III

<i>Comparison of Departments of a Bank</i>	
Loan	101.6
Investment	97.9
Individual Trust	99.2
Bank Operations	104.3
Corporate Trust	102.2
Service	109.8

Still another useful comparison may be made between salaries of a unit from one year to another. This is shown in Table IV. Reference back to Table (Please turn to page 42)

Time in Process

Its Effect on the Economy of Manufacturing

By FRANKLIN G. MOORE

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AMONG the many problems that the management of every manufacturing establishment must face is that of maintaining a reasonably high turnover of materials in process. The higher the turnover ratio that can be maintained, the lower is the investment in inventory-in-process. And in addition to the reduction in investment various other operating economies are brought about when turnover is maintained at a high level. Among these are lower storage costs, less handling of goods, less spoilage and damage to goods in process, and less clerical work in keeping track of goods. These advantages from the quick turnover of goods in process are generally well understood and appreciated by the management of most companies.

A less common approach to the problem of achieving high turnover is to place the emphasis not on the turnover, but on the *time* it takes materials to move through the factory. Obviously this latter approach merely looks at the same problem from a different side, but the different view throws into relief a number of relationships that might otherwise be overlooked. For example, when turnover is considered as the reverse of the time that materials are in process, we see more clearly that shortening the manufacturing time will permit reductions in finished goods inventories and better customer service. If manufactured goods can be delivered to the finished goods storeroom in less time than before, in most cases the volume of finished goods carried can be reduced also. Furthermore, in industries where the style factor is important, quick deliveries from the factory may be important, and the company that can deliver goods the most quickly will get the business. Companies that take longer to produce goods can match the performance of the faster companies only by resorting to overtime work, which is always expensive and often less efficient than regular work.

Findings of Study Made in Five Leading Tire Companies

A study was made recently by the author in which the relationship between processing time and investment in inventory-in-process was investigated. An attempt was made to determine just what was happening

to materials all the time they were in process, what factors determined the length of time and what sort of program would be necessary to shorten the total time that materials stayed in the factory. The study was undertaken in the plants of five of the leading automobile tire manufacturers of the country.

Among the conditions discovered were two which were particularly enlightening. First, practically all of the factory float, the total time spent by materials in the factory, in this highly developed industry was caused by waiting time. And second, there was almost no agreement in the floats of the various companies. The actual processing time in the company with the lowest float amounted to only 7 per cent of the total time materials were in the factory. The goods were being transported 1 per cent of the time, while dead-time or waiting time was responsible for 92 per cent of the total. In the other four companies, however, dead-time comprised from 96 to over 98 per cent of the time the materials were in the factory. In other words, 96 to 98 per cent of the investments in inventory-in-process in these four companies was caused by waiting time.

There was also a lack of uniformity in the total factory float. In one company the material was in the factory for over fourteen days. It took another company over eleven days to make a tire. A third company required almost seven days and another took four and one-half. In contrast with these, one company manufactured completed tires from raw materials in an average of two and one-third days. While it might be thought that the size of company would affect the total float, the study of these factories was inconclusive on this point. The two extremes noted above were found in two of the largest automobile tire factories in the world.

As would be expected, the differences in the length of time it takes to turn out tires are reflected in the investments in inventory-in-process of these five companies. The larger the float, the larger is the number of tires that must be carried in process. If the company with the largest float reduced it to that of the

best company, it is estimated that it would release over four hundred thousand dollars of capital from investment in goods in process, and if all of the companies studied matched the performance of the best company, they would release nearly eight hundred thousand dollars. The possibility of these companies doing as well as the best company seems good when one considers that even in that company ninety-two per cent of the float consists of idle time.

Factors Affecting the Control of Float

A number of generalizations grew out of this specific study which can be applied to the problem in other industries. First, it may be said that the time that it takes materials to move through the factory depends on two general classes of controlling factors; namely, physical factors and management factors. The physical factors include plant layout, the nature of the processes, the processing equipment, the materials handling equipment, etc. These factors may be considered to be fixed at any given time although they can be changed over long periods. Meanwhile they limit the extent to which float reduction may be carried. Management factors, on the other hand, include all of the operating policies and techniques used in the plant. Planning and production control work are specific examples of management factors as are the habits and usual practices of foremen with respect to materials. Of these two groups of factors, the latter, management factors, is the more controllable and, in the case of the tire companies studied, is almost wholly responsible for the idle time found in the float. This was brought out by a detailed examination of the waiting periods found between the operations performed in making a tire. The automobile tire companies, operating in a continuous production industry, probably move materials through production more rapidly than does industry as a whole. If this is true, then in most other industries the same high proportion of waiting time, caused by management factors, exists.

Principles of Float Control

The control of float becomes, then, largely a question of controlling the management factors. Certain basic and fundamental laws exist which may be used as guides in directing this control. These fundamental laws, which appear to be seven in number, are as follows:

1. The law of float and investment.

At any level of production, the investment in inventory-in-process is closely related to the float. Changes in float cause similar changes in investment.

If we assume any particular level of production in a factory, then variations in float will usually cause proportional changes in the investment. If float is cut in half, the investment in goods in process is cut in half. If float is doubled, so is the investment. And if the findings in the automobile tire industry are to be regarded as typical, we might, considering the large preponderance of dead time in float, develop a corollary law as follows: At any level of production, the investment in inventory-in-process is directly related to the dead-time. Changes in the investment vary directly with changes in dead-time.

2. The law of even production.

The lowest investment in inventory-in-process is attained when production is carried on evenly and continuously.

This law states that the lowest inventory-in-process comes when production is carried on evenly twenty-four hours a day and seven days a week. If a company working one eight-hour shift a day for five days could change to three eight-hour shifts a day for seven days by arranging to have its production flow through in a thinner continuous stream, the inventory-in-process would be reduced seventy-six per cent. This reduction would come from two sources; first the inventory would be reduced two-thirds as production was changed to a twenty-four hour basis, and second, there would be a further reduction of two-sevenths as the production formerly turned out in five days was spread over seven days. The law would work in the opposite direction also. If the number of working days were reduced, the float and the inventory would be increased. If a company operating seven days reduced operations to five days with the same total weekly output, the dead-time and the total float would be increased because materials would be idle over the week-end. The investment would increase two-fifths or 40 per cent. Likewise, changing from twenty-four hours to eight hours daily with the same total production would increase float by causing materials to be idle sixteen hours of this twenty-four. This would treble the inventory-in-process and the investment in it.

3. The law of factory float and finished goods.

During periods when the finished goods inventory is maintained at a low level, changes in factory float cause similar changes in the finished goods inventory float, and in the investment in the finished goods inventory.

Even though finished goods inventories are usually kept at the lowest possible point, this point must be

high enough to prevent exhaustion of the supply before it can be replenished from new production orders given to the factory. This means that the inventory of finished goods, except before peak periods, is held at the minimum at which customer service can be maintained without interruption. If, then, the factory float is reduced, replacement goods can be obtained more quickly than before, fewer goods need be carried in the finished goods storeroom, and the investment in finished goods will be reduced.

4. The law of economy of float.

The amount that can be spent on expenses to reduce float is never less than the income on the released funds, and if capital expenditures are also required, the released money itself may be utilized.

It is obvious that the amount a company can afford to spend to bring about a reduction in float is at least as much as the income from the released capital. But in addition to this amount, it could spend, if necessary, the capital to be released if equipment purchases or other investment of more permanent nature were required. While the investment in inventory is generally considered quite liquid, this is not true of the minimum investment in inventory, for this minimum amount is a permanent investment. If an investment in machinery would permit a reduction in inventory, it would pay to install it, provided the capital released from the inventory is greater than the cost of the equipment.

5. The law of length of float.

The longer the float in any factory, the more probable it is that it can be materially reduced, thereby releasing capital.

6. The law of dead-time proportion.

The greater the proportion of float that is made up of dead-time, the greater is the possibility of reducing float.

These two laws should be considered together inasmuch as they relate to the possibilities of reducing float. Both are so self-evident that they might easily be overlooked if they were not formulated. The first states that, as a general rule, long floats are likely to be susceptible to reduction. This principle rests on the assumptions that long floats contain large amounts of waiting time, and that waiting time is more easily shortened than operation or transportation time. The first of these assumptions is necessarily true in many cases. If there is a large amount of dead-time in the float of a factory, then that float must be large because it includes the large amount of dead-time.

The law of dead-time proportion emphasizes the importance of the composition of float. This law, like the law of length of float, rests on the assumption that dead-time is more easily reduced than operation or transportation time. It differs from the preceding law, however, in that it calls attention to the proportional relationships between the dead-time and the other parts of float. If the proportion of dead-time is high, then there is a probability that the float can be reduced even though in some cases it may already be short.

7. The law of mass production.

In large-scale production, the float tends to approach the actual operating time as a limit.

Stated differently, this law says that the greater the volume the greater is the chance of eliminating the dead-time from float. The law is adapted from one of the laws of production control developed by Leon P. Alford.¹ It deals with the ultimate possibilities of the reduction of dead-time, but it should begin to apply before the ultimate in large-scale production is reached. It should be noted that this law does not imply that large companies do have shorter floats than smaller producing units, but only that they could have shorter floats than the smaller concerns. As production increases, the scale of operations permits the elimination of more and more waiting time. Floats of the automobile tire companies studied showed little effect of the operation of this law. This, however, merely emphasizes the fact that float is not automatically reduced as the size of the company increases. The management of large companies has greater opportunities for reducing float than does the management of small organizations, even though they may not always take fullest advantage of them.

Amount of Capital Released by Reduction of Float

Several years ago Ralph C. Davis² worked out a number of formulas bringing out the relationships between float, inventory investment, and turnover. To these might be added several which management could use as tools to determine directly what the effects of proposed changes in float would be on investment and earnings. Since the changes in float will cause proportional changes in inventory-in-process, the following relationship is true: If I_1 and I_2 are used to represent the investment before and after a float reduction and

¹ Leon P. Alford, "Laws of Management," page 128, The Ronald Press, New York, 1928.

² Ralph C. Davis, "The Effect of 'Dead Time' on Inventory in Process," *Society for the Advancement of Management Journal*, (May, 1936) pages 71-74.

F_1 and F_2 to represent the old and the new floats, then:

$$I_1/I_2 = F_1/F_2$$

And if C is the amount of capital released

$$C = I_1 - I_2$$

A similar method could be used to find the release of capital from the finished goods inventory. If float were reduced one day the finished goods inventory could probably be reduced at least to the extent of one day's receipt of goods from the factory. Float reductions of greater magnitude would permit proportionally greater reductions in the finished goods stock.

Reductions in factory float do not always cause reductions in the finished goods inventories, however. Just before sales peaks most concerns build up inventories to meet the demand during the short time that sales outstrip production. During this period quicker deliveries of particular sizes or kinds of products from the factory would not have any effect on the reserve stock of finished goods accumulated. Only if the factory's rate of output were increased could the finished goods reserves be reduced. It is necessary to build up large inventories of finished goods during but part of the year, however. During the rest of the year while inventories are kept at the minimum, reductions in the factory float permit corresponding reductions in the finished goods stock. If we assume that capital can be released from finished goods stocks for only six months of the year, it is equivalent to the release of half of that amount for a whole year. Then, if we let C' equal the amount of capital released, $C'/2$ is the equivalent year round release of capital, and if T is the total year round release of capital coming from a reduction in factory float,

$$T = C + C'/2$$

The additional earnings could then be computed by multiplying T by the earning rate on the released capital.

Management might, however, wish to know how much its float would have to be reduced to release a particular amount of capital from the inventory-in-process. This can be done by using the following formula in which C is the capital that it is desired to release and R is the necessary reduction in float.

$$R = F_1(C/I_1)$$

Or if management wishes to release a specified amount from the finished goods inventory and R' is the reduction in float required and C' the amount it is desired to release, then:

$$R' = C'/D$$

In this formula D is the value of finished goods delivered daily to the finished goods storeroom. It will give the reduction in float required to release the specified amount of capital for one half year. R' will have to be multiplied by two to give the reduction required to release the same amount on an equivalent annual basis.

Methods of Controlling Float

If management is to control float closely, one of the most important needs is some sort of regular report which will give warning when float increases. Two methods of getting this information are suggested. First, the accounting department could supply management with regular reports covering the extent of the float in each production department. The float can be accurately computed by dividing the total of the materials costs of the inventory-in-process in any given department by the materials costs of the average daily deliveries of goods from the department. From these reports management could tell readily if delays in the movement of materials were taking place and could immediately isolate the trouble by departments.

Another method, somewhat longer, should be used less frequently yet at regular intervals. This method is to take a time study with a stop watch of the movement of materials throughout the factory. In the author's study in the automobile tire companies, this was the method followed. The time the materials were in process was studied much in the manner of taking a time study of an operation. The materials were followed step by step through all processes, all movements, and all waiting periods. It was necessary to break the time down into small parts for timing. These were called "matelements," a contraction of "material elements," because they were similar to the "elements" into which an observer breaks down an operation performed by a worker for time study purposes when setting standards. Each matelement was timed and later classified as operation time, transportation time, or waiting time. When the various classifications were totalled, and when float or process charts were drawn up, it was possible to see just what was happening to the materials all of the time.

Benefits Derived from Making a Time Study of Materials Movements

As a result of the use of this method in making the study in the automobile tire companies, it was discovered that from ninety-two to ninety-eight per cent of

the total float was caused by waiting time. Further investigation into the specific instances where waiting occurred showed that often there was no apparent reason why the waiting time could not have been eliminated.

The method suggested, making float charts after time studying the movement of materials, has also the merit of presenting to management a clear view of its manufacturing process, step by step. This clear view may reveal hitherto unrealized conditions with respect to the productive operations. This was illustrated in the charts and material analysis sheets of the five companies. It was found that the materials were picked up or put down by workers no less than forty-two times in any of the five companies and sixty-eight times in one. This occurred on each of over twenty thousand tires a day in the larger companies and cost each of them no less than one thousand dollars a day. The mere existence of most of these handling instances would not be known without making a time study of the movement of materials. Yet with such knowledge management might eliminate some of this handling and reduce costs materially. Most of these instances of tire handling are performed by production operators, whose major task is listed as some production operation. As a result there is no record of the total of such handling time. The above example illustrates the kind of infor-

mation that can be obtained from a time study of materials movements.

Periodic Reports by Departments Needed

The problem of float control is one which management appears to have neglected to some extent. The extremely large proportion of dead-time found in the processing of automobile tires is probably characteristic of most manufacturing industries. Idle time is the principal part of float and is responsible for almost all of the investment in inventory-in-process as well as part of the investment in finished goods stocks. The study of float and its reduction should have a place among the important problems of factory management. It is comparatively simple to install the procedures for discovering and keeping informed on the extent of float. Both the departmental float reports and the time study of materials movements can be worked out easily. The float reports from the accounting department should be made periodically and the time studies should be made whenever float increases. But even if no unsatisfactory condition seems to appear, a complete time study of materials movements all of the way through the factory should be made from time to time. The new view of operations and additional information which such a study would afford would without doubt prove of value to many companies.

George Hugh Shepard

December 28, 1870

GEORGE HUGH SHEPARD was born December 28, 1870 at Tremtealeaw, Wisconsin. After his graduation from the Eau Claire high school he entered the United States Naval Academy in 1886 from which he graduated as Ensign in 1891. He served in the Navy until retired in 1898 because of an injury received in line of duty. Throughout his career he retained the viewpoint of a patriot in the service of his country.

Continuing his education he received an M.M.E. degree at Cornell in 1902 and remained at that institution four years until 1906 when he went to the University of Syracuse for nine additional years as teacher. He was for six years a consultant and associate of Harrington Emerson, industrial engineer.

With the outbreak of war in 1917 he returned to active naval duty, serving as efficiency engineer at the Norfolk Navy Yard with rank of lieutenant-commander

July 30, 1939

until he joined the Purdue staff in the fall of 1919 as Professor of Industrial Engineering and Management.

In his thirty-five years as teacher he continuously championed the cause of industrial effectiveness and, more important still, the cause of personal efficiency on the part of his students. To many thousands of young men he brought home the necessity of so budgeting time that a full and satisfying life could be lived on twenty-four hours a day.

He was the author of two volumes, "Industrial Management" and "Industrial Engineering," and also the contributor of numerous articles to engineering publications. He was a member of the International Committee of Fatigue, National Board of The Society of Industrial Engineers, American Society of Mechanical Engineers, Society for the Promotion of Engineering Education, and The Society for the Advancement of Management.

Job Evaluation Analyzed

By KENT F. BRADBURY

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JOB evaluation is important, first of all, because the effectiveness of workers is strongly influenced by their feeling as to the fairness of their compensation. They are interested not only in the absolute amount of compensation, but in the relation of their compensation to that of others; and they will find it almost as unsatisfactory to have other jobs overpaid as to have their own underpaid, especially if the other jobs are, or seem to be, fairly comparable to theirs. The basic rule of job evaluation, therefore, is "equal pay for equal work."

Economics of Job Evaluation

There are economic reasons for the importance of job evaluation which are not so often recognized. According to the classical economic concept, a man's labor is a factor of production like a ton of coal, and has a price determined by supply and demand. Practically all compensation plans are based on market rates for different kinds of labor. But rates for similar work among a number of organizations may differ widely, because some of them will pay more than they must. Some of them will pay more because they are more efficient. Even among those who advocate market rates, many will be found who do not actually pay them; for there is a tendency to recognize to some extent another concept of wages—that they are a share in the distribution of income from production. The price he will take is no longer the only measure of the value of a man's work. This is partly because labor has become less mobile, and partly because business organizations have grown and become more specialized. Some workers still do sell their labor from day to day in the open market by changing jobs frequently, but many of them are out of the open market, having their compensation set and their advancement controlled by adjustments within organizations whose interests require a low turnover of labor.

Another economic end of job evaluation is the maintenance of a balanced labor market. If certain occupations are compensated at rates out of proportion to their difficulty, training requirements, and working conditions, maladjustments will occur in the labor market.

The overpaid occupations will attract a disproportionate volume of labor. Economic theory tells us that these maladjustments will be temporary, due to the effect of an abundance of labor on its price; but sound bases of compensation can contribute much to economic and social stability by preventing or mitigating such maladjustments. It is even easier to demonstrate the effect of underpayment of certain occupations: people will cease to be interested in the underpaid occupations, and shortages will occur, the adjustment of which will involve social stress and may be delayed because young people will have stopped training themselves for them. Among the conditions affecting labor supplies are: the native ability required in the occupation, the kind and amount of training necessary and the situation with respect to the availability of training, prestige, and working conditions. As for the economics of labor demand, it is true that within limits it will be affected by the cost of other types of labor which might be substituted with a rearrangement of facilities or productive processes, or by the cost of capital, since capital is a substitute for labor. This leads to consideration of the concept of wages which associates them with productive values. But even if this were a workable concept, it would not be a sound one, even in theory; for a compensation plan based on productive values of various occupations and failing to recognize skill required, kind and amount of training necessary, etc., would be unsatisfactory, because it would not attract labor to the occupations in the proper proportions.

From all of this it is clear that a method of job evaluation is needed which will involve more than superficial comparisons of jobs and more than consideration of prevailing wages.

A preliminary step in job evaluation is job classification, which involves job analysis and the determination of classes, which are groups of jobs so alike in difficulty and responsibility and working conditions and qualification requirements as clearly to warrant the same treatment in the employment processes of selection and training and the same compensation. Jobs differing to a substantial degree in any one of the above respects are in separate classes, though for convenience the

classes will be placed in occupational groups and even more closely related groups called series. If jobs do not clearly belong in classes with others, an indication of whether they should be considered separate classes may be obtained through their separate consideration in the evaluation process. A class may consist of just one man's job. Even when it consists of several jobs, the term "job" is often used synonymously with "class" and will be so used herein.

The classification plan having taken form through the preparation of class or job specifications, there then begins the evaluation or comparison of jobs. The various methods of comparing jobs fall fairly definitely into two categories. One of these consists of what might be called the over-all comparison methods, which include various systems of job ranking and grading plans, where the basis of comparison is general appraisal involving weighing job against job by over-all consideration. The point methods, on the other hand, though they have a great number of variations, all involve some scheme of attaching point weights or values to formally segregated factors of the jobs. Each of the methods has its ardent advocates. It appears to have been generally assumed that they occupy polar positions and are quite incompatible; but some of the over-all comparison methods are not essentially different from some of the point methods. In fact, the methods might feasibly and advantageously be used in a complementary way, if one of the simpler point methods were employed.

Of course, any process of job comparison, even the simplest job ranking method, involves recognition, conscious or unconscious, of certain job factors, and the application to them of some kind of mental weighting, comparison, and summing-up process. This points to the desirability of having an understanding as to legitimate evaluation factors and their approximate weights in the various jobs or types of jobs, as a basis for job to job comparison. Some have done a great deal more than others in the way of setting up analytical guides for over-all evaluation.

Concepts of Evaluation Factors

The point methods have as their basis the concept of factors common, if not to all jobs, at least to jobs in a fairly wide range of levels, and according to that concept, the differences in jobs are reflected in differences in the values which can be attached to these factors as between two jobs or among a number of jobs.

Sometimes the over-all comparison methods involve a different concept of factors. This is that differences

in jobs are reflected in the presence of additional or different elements, more in the nature of tasks than of factors. This leads to the problem of how much weight to attach to the most difficult element of the job. The argument in favor of evaluating chiefly, or even entirely, on the basis of the most difficult element is that it is a logical recognition of the fact that men must be hired in the market who can handle the most difficult element, regardless of how little time it occupies or how much less difficult the other elements are. This is quite sound, and in many cases it would be inexcusable to overlook it, as in the case of jobs which are mixtures of quite different elements, or tasks, or occupations; but, in operation, problems are encountered, such as tendencies to spread difficult work, with resultant necessity for determining what is a sufficient amount of more difficult work to warrant consideration in evaluation. Salary-paid jobs, more often than hourly-paid jobs, are of the type containing mixtures of elements, or tasks, and more often lend themselves to the application of this concept. The other concept could probably be used more extensively in the evaluation of jobs in both categories which are not too definitely mixed jobs.

Comparison of General Methods

The general procedure in the over-all comparison methods is to rank the jobs unit by unit and department by department, using pooled judgment of analysts and unit and department heads, and even of employee representatives. Some use the average of the rankings of a number of raters. There is danger in this of making the process too mechanical—of failing to give sufficient attention to the analytical processes which lie behind the average. There should be exchange of thought among the raters which will tend to compose wide differences of opinion.

The final step in the over-all methods is fitting the jobs, as ranked, into grades which cut across all departments. The grading plan is the framework by means of which like jobs in different divisions and jobs of different kinds, but nevertheless of equivalent value, are given the same rate of pay. Theoretically the number of grades depends only upon the number of distinct levels of difficulty, responsibility, etc.; but, actually, the number is often based on opinions as to appreciable differences in rates of pay. Sometimes the unscientific practice is followed of developing the grade framework first and then merely sorting jobs into grades without previous ranking.

The great test of the method is interdepartmental

comparison. It is here that the need for truly analytical process evidences itself with greatest emphasis. There is no basis for comparing unlike jobs in different departments except on the basis of common elements. Insofar as the over-all methods do not lend themselves to this kind of analysis or fail to recognize the importance of it, they contain a fundamental weakness.

The point methods in general involve the formal determination of the basic value-influencing factors common to jobs, the separate evaluation of such factors, and the reflection or translation of such evaluation through the assignment of point ratings to factors, the total of the factor ratings for each job being taken as its value. Differences in the significance for evaluation purposes of various factors are usually recognized by some kind of weighting method. One of the common ways is the assignment of different maximum point allowances for the factors. Unless there are guides for working out the points assignable below the maxima, it will be more satisfactory to have factor weights by which factor ratings from one to ten may be multiplied to obtain the point value of the job.

Important features of many point methods are various uses of pooled judgment in assigning points to factors and determining weights to be given them. Few of the available descriptions of pooled judgment schemes mention what should be logical scientific adjuncts of the schemes—namely, trial applications and at least rough tests of statistical reliability for what they may reflect on the satisfactoriness of the choice and definition of factors and the fitness and training of the raters. It is doubtful that a satisfactory degree of reliability can be obtained without discussion among the raters before the initial rating, or afterward, as part of an adjustment procedure before evaluations become effective.

Practically all of the point methods apply the same set of factors and the same weights in the evaluation of all jobs. This makes it impossible sometimes to take proper account of unusual importance of factors in some jobs, unless different weights can feasibly be assigned to the same factors in different groups of jobs. This would involve a preliminary classification of jobs into groups for the purpose.

An advantage of the point methods is that they provide a written record of the basis of evaluation. This is an important aid in reviewing evaluations and, possibly, in satisfying workers or their representatives as to the fairness of evaluations.

No point method is scientific in the sense that it has

the stamp of mathematical validity upon it; but the point methods undoubtedly have a place in the science of management as devices for making systematic use of analytical judgment. They have their theoretical justification in the fact that they may take more accurate account of the multiplicity of job factors and factor weights than is possible in over-all evaluation. They are not proof against errors of judgment, even though group judgments may be used to eliminate some of the guess work. There may even be a multiplication of errors, because judgment enters into the weighting of factors and again into the rating. Some of the point methods seem to be mathematical window dressing—superficial devices which no sincere management would attempt to uphold as a sound basis for such a difficult and important technique as job evaluation. The emphasis which many of those who have written of the success of their plans have placed on winning employee acceptance smacks less of sincerity or science than of opportunism.

Definition and Classification of Factors

There are many variations in the nature and number of factors recognized in the point methods—more than could be accounted for by differences in conditions in the various organizations using them. The number ranges from three to as many as fifty. The assignment of points to more than fifteen, or, at the most, twenty, is almost certainly an unjustified refinement. Some basic factors may be defined in terms of lists of sub-factors, which are not themselves rated. Definitions of factors, and if feasible, of varying degrees of values within factors, are important. Frequently the methods recognize three main factors: (1) skill or ability required; (2) responsibilities; (3) working conditions.

When the factors are so classified, skill might include the following subsidiary factors, some ratable, some not: (1) intelligence; (2) training and experience, which may be measured in terms of learning time; (3) ingenuity; (4) initiative; (5) knowledge; (6) dexterity; (7) accuracy; (8) versatility; (9) judgment; (10) complexity of problems encountered; (11) variety of problems encountered; (12) analytical ability; (13) observation; (14) memory.

Of these a favorite is learning time, which may be considered in two parts, one the time to acquire basic occupation knowledge, and the other the time to learn the job itself. The learning time factor may be supplemented with consideration of the money expenditure necessary to acquire the training.

The intelligence requirement is not a satisfactory independent factor. General intelligence is such an indefinite concept that it is better to take account of it in factors more measurable or easier to compare. Such factors may be found among those listed above, as will factors within the concept of mechanical intelligence. Social intelligence is usually quite logically considered in the category of responsibilities under such headings as "contacts with the public," or "supervisory responsibilities."

Under the category of responsibilities are generally considered some of the following factors: (1) responsibility for safety of others; (2) responsibility for materials; (3) responsibility for equipment; (4) responsibility for quality of product; (5) supervision exercised; (6) supervision received. Responsibility for materials and responsibility for equipment are measurable in terms of cost of errors. This is an interesting recognition, in a negative way, of net productiveness of the job as an evaluation factor. The cost of errors, as measured by the cost of machinery, equipment, materials, etc., or by the average cost of errors as judged from experience, should be supplemented by consideration of the element of "difficulty of preventing errors."

When job factors are grouped in just three major classifications, working conditions become a catch-all for several types of factors. There are, of course, the environmental factors of accident hazard, health hazard, eye strain, dust, dirt, fumes, heat, noise, dampness, and other factors making for discomfort or undesirability of surroundings. Various combinations of these are recognized in various ways, and their recognition in evaluation seems proper for the purpose of drawing labor to undesirable jobs, or, assuming that satisfactory workers would be drawn anyway, for the purpose of compensating for hardships and making all workers more nearly uniformly happy. Also under working conditions have been placed the category of connected expense factors, including personal financial loss through errors, effect on clothes, cost of tools or special equipment personally furnished, medical expenses, etc. It would be more realistic for the employer to meet most of these expenses directly himself instead of purporting to recognize them in evaluation.

In another category of factors, sometimes placed under the heading of working conditions, and sometimes placed in a separate group, are those pertaining to application, or effort. These very often are broken down into physical effort and mental effort, though the latter is probably adequately covered in the skill or abil-

ity group. In consideration of physical effort the emphasis may be on the maximum exertion required, or it may be on the total energy expended on the job over a period of time. Often there is recognition of physical, mental, or nervous fatigue. Fatigue is related to monotony, which is sometimes considered as a separate factor. The trouble with this, as with other factors in the category, is that the consideration which it should be given depends upon the characteristics of the worker. The fatiguing or monotonous qualities of a job may or may not be burdensome to the worker, depending upon his physical, nervous, and emotional characteristics. One theory is that these factors should not be considered in evaluation because it is better to eliminate the difficulties involved by having proper selection of workers equalize the burden. Actually the equalization will be far from perfect; so it is more realistic to attempt to recognize these factors in evaluation, as most of the plans do, by setting up an average man concept. The concept of a fair day's work is also involved. Not only the length of the work day but the speed and endurance requirements of the job have a relation to this group of factors. Evaluation of physical effort and fatigue might not be valid in plants not having fair work standards. A factor called "pace" is sometimes recognized. This in combination with strength is about equivalent to physical effort. Volume of work is not generally considered a good factor; however, it may be considered in the evaluation of hourly-paid jobs, provided good work standards prevail, insofar as it affects pace and, hence, physical effort. Pace probably warrants consideration in the evaluation plan even where an incentive plan exists, because it has significance in the evaluation of the job for standard output; that is, pace has significance below as well as above the work standard set by time study, and incentive wage increments recognize it only above standard output. Inclusion of pace, or physical effort, in evaluation provides a kind of protection to workers against speed-up and rate cutting; so it may have practical as well as theoretical justification, in that it may help to satisfy workers as to the fairness of the plan.

The factors chosen for a particular plan can be woven into a workable pattern by (1) using them merely to define major factors, (2) assigning them points individually, with or without weighting, (3) grouping them for rating in combinations which may not require weighting. If the method is over-all comparison, or if over-all comparison is a part of the

evaluation procedure, the outline of factors should be used as a check-list for use in job ranking.

Pay Rates and Pay Curves

The final step of job evaluation is the fitting of the pay scale to the jobs as graded or assigned points. Theoretically it is possible, and even desirable, to ignore existing rates and to develop a pay scale which reflects differences in skill, kind and amount of training required, responsibility, working conditions, etc., and which gives only slight recognition to prevailing rates of pay. The general practice, however, is to tie the pay scale at several points to the rates paid for equivalent work elsewhere, as determined by surveys of prevailing rates for certain key jobs. The key jobs should be jobs which stand out in the organization and which are clear-cut and contain the combinations of factors which make them useful as bench marks, and must, of course, be jobs which are common to other companies. The number of key jobs chosen depends not only on the number available but also on the policy as to the closeness of tie-up with prevailing rates. If the evaluation is reliable, the internal evaluation can be allowed to shape the pay scale almost entirely, the key jobs being paid prevailing rates or higher. Some key jobs may have to be paid higher above prevailing rates than others in order to bring their rates in line with the evaluations, or, in other words, to have a plot of rates as ordinates and grades or point values as abscissae take the form of a smooth curve. The curve will ideally be a rising parabola, for rates should rise progressively faster with greater job values. The best technique is to obtain rates for other jobs by interpolation from such a curve. If the jobs have been graded, rates will be obtained for the various grades, with increasing increments for the higher grades. By interpolation, tables can be constructed for converting point ratings into specific rates of pay, such as cents per hour. Then increments of cents per hour will stand for increasingly wide ranges of point values. This is sounder than assigning a fraction of a cent for each point, which is the same as assuming a straight line relationship between rates and point values.

A refined procedure is to plot the rates paid for jobs in a number of other companies comparable to each of the key jobs, and to draw a free hand curve through approximate median rates, instead of attempting to ar-

rive at an arithmetic average to be plotted. This recognizes that there may be so much dispersion about the average for any given job that the arithmetic average may not be significant.

Another technique of shaping the pay scale, which is not necessarily an alternate method, but may be used in a complementary way, is to plot rates paid to most or all jobs in the company against point values or grades as abscissae, and to draw a free hand curve through approximate medians, or to derive a curve by the method of least squares. Such a plot will indicate where the rates are farthest out of line and will bring out any peculiarities in the shape of the pay scale, the reasons for which may be considered before making alterations in rates. The shape of this curve may indicate needs for correction in the classification plan.

In most cases, minimum and maximum rate curves are drawn in addition to the median curve. These mark off ranges of pay for the various grades or point values. In theory the range should reflect the scope of possible differences in the value of individuals on the job or in the grade, and hence should be of variable width. In practice, however, the maximum and minimum curves are smoothed out, the only variation in width of ranges being due to a gradual divergence of both curves from the median curve as the higher valued jobs are approached. The minimum curve will be at least as high as the hiring rates in the market. The maximum curve should be high enough above the minimum to allow five or six steps in pay for each job. Both curves should, like the median curve, have a constantly increasing slope. Overlapping ranges for successive grades or point values are customary; that is, an experienced man or a very efficient man in one grade may be paid more than a beginner or an inefficient man in a higher grade.

A job evaluation plan providing ranges of pay may be used in conjunction with a bonus or commission or piece rate system. The maximum of the ranges represents the highest rate of pay which the job normally justifies; it is the proper rate for maximum efficiency on the job, and is the rate for the piece rate or bonus fixers to use as a guide in setting up the incentive system. The earnings of the workers may at times rise above the maximum, but the theory is that they will not average more than the maximum over a long period. Where the base rate for the incentive system shall come in the pay range is a matter of company policy.

Is Industrial Self-Government Possible?¹

By ORDWAY TEAD

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THE Federal Government is at the moment engaged upon a study to determine what should be public policy regarding the relation of government to business. At the heart of the study lie two basic questions which cannot be ignored if any worthwhile result is to emerge: how can we achieve maximum desired productivity; and how do we constitute the control and administration of business operation in order to make it truly democratic?

The issues must be seen as lying deeper than trust-busting or regulative processes, deeper than assurances of collective bargaining or of "fair competition."

At bottom the issue has to do with the conduct of economic activity as giving effect to a public interest—as affecting beneficially the well-being of the people of the country as a whole. If this assumption is accepted, a beginning can be made by asking how we may know when a public interest is in fact being served. We are by no means without guides to the answer to this question. The following are criteria which should gain fairly general acceptance: sufficiency of output, low costs, good quality, competent technical management, flexibility which allows new products to supersede or be added to those already demanded, and finally some articulate representation of the voice of the interested groups in reaching basic decisions of policy as these affect them.

Were we to attempt to rate objectively our numerous industries against these criteria, we might well be surprised at the low ratings now obtainable. And I for one share the view that broad influences of world-wide impact are making it increasingly difficult to improve any such hypothetical ratings under present methods of operation. Any notion that we can or will return to business conditions as America faced them in the middle twenties is unrealistic. Whether we will or not, we must look ahead to some fresh approach to industrial operation, an approach that will give some presumption of combining fuller employment, greater production, greater stability of economic activity and greater autonomy of controls within the operating agencies.

The Industry, Not the Company, Is Basic Economic Unit

An important contention here will be that this fresh approach should start with the industry as the significant nucleus of concern and of functional effectiveness.

If it be objected that the corporation rather than the industry is the crucial unit for scrutiny in any effort to understand our difficulties, it may be well to clarify at once why the democratic and productivity approach here taken involves a viewing of economic operations with the industry as the basic economic unit.

Any constructive view of productive operation requires that we keep in view the several factors which have to work together to assure low cost and bountiful output of honest goods. These factors need not here be analyzed; it is sufficient for the present purpose if a suggestive, outline check-list is included.

1. As to the function of production, cost and efficiency *from the public standpoint* are affected by:

Location of plants as related to labor supply, as related to access to materials, as related to markets.

Number of plants and degree of obsolescence of their equipment.

Ability to introduce newest machinery and speed with which this is done.

Regularity and stability in plant operation.

Technical competence of management in helping to get low unit costs from every angle.

2. As to the function of distribution, cost and efficiency are affected by:

Correct estimates of effective demand as related to different unit price levels.

Correct estimate of rise or fall in demand for competing products and of current consumer incomes.

Economical control of total handling costs of materials and finished goods.

3. As to the function of personnel, cost and efficiency of operation are affected by:

Existence of agreed minimum standards on wages, hours, working conditions.

Availability of a supply of willing and competent workers.

Management in each operating unit which gives effect to modern personnel policies.

¹ In somewhat different form, this article comprises a chapter in the author's recently published book, "New Adventures in Democracy," (McGraw-Hill Book Company).

Local community conditions favoring good health, good housing, good education.

Existence of labor organizations and of collective agreements with them.

Existence of public regulatory provisions which affect personnel costs and quality.

4. As to the function of finance, cost and efficiency of operation are affected by:

The availability of new capital as needed for replacement or extension.

Uniformity of accounting and cost accounting practices among operating units.

Public regulations as affecting corporate surplus, profits, salary publicity.

Methods of determining need for new investment or for retrenchment from present unused investment.

Careful study of this far-from-exhaustive list will reveal the fact that on most of these important items, determinations of policy and practice to the extent they are now made by *single corporations* cannot be effective in assuring low cost and bountiful output.

No corporation can actually live to itself alone and unaffected by competitive and other influences in carrying out its policies of production, distribution and the rest. Indeed, the single company is constantly being guided in its decisions by its guesses as to what competitors have done and will do. Upon such clever guesses depends much of its chance of success. Even so, in practice every competitor does not succeed equally; and if the right guesses and wise moves of the successful could be taken over by every competitor, the differential advantage would disappear and efficient methods instead of being a blessing, would surely lead to a concerted demand for a restriction of the output by the industry as a whole. If every company were as efficient as the best company some major readjustment somewhere would be required to keep them all in business.

Whether one thinks of a "sick" industry like bituminous coal, a highly competitive industry like cotton goods, or an industry of so-called "administered" prices like automobiles, it is, of course, true that there is still—and should continue to be—a natural self-interest which any one smart producing unit can pursue to assure profitableness through low costs. This self-interest yields—and should continue to yield—certain advantages to executives and to all other workers. But the very methods dictated by enlightened self-interest if simultaneously employed today by every company, would have to result in some effort to restrict produc-

tion, both because there is a quickly reached limit to market demand at a price and because problems of lowered cost and therefore lowered price to give rise to widened effective demand would necessarily require collaboration among members of an industry to allocate and stabilize output profitably and in the public interest.

The assumption, accepted widely while the country was growing, that the pursuit by every competing company of its enlightened self-interest would inevitably work out to the public good, becomes less and less true. The industry becomes the more crucial economic unit, as publicly viewed,—that is, viewed as a goods producer more than as a profit producer. Yet the pursuit of its self-interest by an industry under present terms and through familiar trade association patterns and the assumption that this would automatically serve a wise public interest,—this is certainly not the position here affirmed or defended. Self-interests of competing companies may well be powerful and necessary interests to count upon and use as part of the total economic motivation. But my entire premise is that unless and until there exists competent machinery of co-ordination and control (as voluntary as possible) that can somehow view the problems of economic effort as matters of assuring the conduct of the "national factory" for the good of the "national housekeeping" (to use Dr. Walter Rautenstrauch's analogy), the self-interest appeal has to be tempered by and tied in with the appeal also to broader public purposes and criteria.

The same conclusion applies with equal if not greater force in the semi-monopolistic industries—industries where advantages of size, large investment, control of special patents, raw materials and the like, make price rigidities relatively easy to maintain. Here, too, neither the interest of the single company nor of the entire industry is obviously one which gives prior claims to abundant output at low cost. There is usually a point of restricted volume where total profit is greater than would be true with a smaller profit per unit on a larger volume.

Public Controls

If it be said that this analysis introduces needless complexities, not to say unrealities, it is next in point to remind ourselves just where the American people stand today in their by-no-means-unexplored effort to control production with some public or democratic standards in view. Efforts at public "interference" are a fact of growing importance,—efforts virtually forced upon the country by the progressive awareness of some one or more groups that less than justice was being done, less

than full service at reasonable cost was being rendered in this or that industry. The already mentioned inter-departmental study of the Federal Government under the Temporary National Economic Committee is but the latest of many recurring acknowledgments of public confusion and search for guidance.

Several already explored lines of attack from the public view deserve mention, as suggesting present deficiencies and future needs. There is, first, the attempt to regulate the so-called natural monopolies—or the large interstate agencies of transport and communication. This began in 1887 with the I. C. C. There is, next, the effort to control monopolistic practices as they may arise "in restraint of trade," under our anti-trust legislation, either by Federal prosecution or by some voluntary acceptance of a "consent decree." Next, there is the effort against "unfair trade practices," as conducted by the Federal Trade Commission. There is the public corporation of which the T. V. A. is an example, with or without the introduction of the "yardstick" idea as a force to exert pressure to lower competitive prices in private plants.

From a somewhat different angle we have the experience of the war years with the integration of war industries, with which was coupled in several industries the existence of what were virtually national collective agreements between the employers and the labor unions of the industry. This experience was forgotten in the prosperous twenties; yet in this period the trend to holding companies, consolidations and mergers to limit competition was pronounced. For depression reasons of cut-throat competition and profitless prices the National Recovery Administration, however, again represented an attack upon this problem of public interposition from the point of view of the industry as the unit. To be sure, the attack was too sweeping; too many industries were involved, too much power was reposed in the hands of trade associations; the consumer interest was all but ignored. And in only a few cases were the unions of the industry made active parties to drawing and administering the codes. Yet the whole experience is relevant as showing the economic necessity of dealing with industries as the units of administration from any public regulative standpoint.

Since the NRA demise, the logic of approaching industries as units has not been wholly forgotten either in respect to problems of trade practice or of relations with organized labor. Indeed, the economic influences making in this direction with a certain inevitability are not confined to our own country, as the history of

European cartels and of more *ad hoc* bodies in the cotton, electric power and iron and steel industries of England suggests.

This background is not presented to lead up to any uncritical acceptance of something loosely called "self-government in industry"—using that term to mean the granting of a free hand to the employers of an industry to maintain prices and restrict output, nor yet to endorse national collective agreements between strong trade associations and inclusive labor unions as complete answers to the problem.

The Way Ahead

Out of all this experience which I submit looks definitely in the direction of strengthening a certain kind of tendency, several broad ways of moving ahead do, however, seem to emerge. We can extend public regulation in the patterns with which we are familiar. Success in that direction has not been conspicuous, to say the least. We can follow the anti-trust law formula—an equally frustrated and sterile attempt. We can have public ownership of selected national industries; but if and when we do (as, for example, on the railroads) the problem of some more truly democratic form of administrative control will remain to be evolved. (Older readers will recall the proposed "Plumb Plan" of fifteen years ago.) Not all, but many vital issues of democratic policy and method remain unsolved under the usual forms of public ownership as we now know them. This is not to say that the question of who holds title to productive property is not important; but its importance may well have been over-emphasized in the familiar socialist analysis. And this would be especially true if for certain types and sizes of industry a more autonomous, industry-wide administrative structure under genuine public control can be evolved.

The present approach of the *industry as a unit* is dismissed by many because of a recognition of certain crucial weaknesses of this approach in the past, which I hasten to acknowledge and underscore. No proposals which fail to take account of these shortcomings which experience has already revealed, would have any democratic or economic validity. These weaknesses have to do with the dangers of countenancing a private agency for potential price control which becomes virtually too powerful to be regulated; with the weakness or absence of any consumer voice; with the weakness or absence of the voice of the workers; and finally with the failure to acknowledge the importance of matters of inter-industry relations and balance.

All this leads up to the proposal offered as an *approach* rather than as a blue print, that industries which have reached a certain point in terms of stability of market and of products, and of degree of employer and of employee organization, be empowered under careful Congressional enactment to form an industry-unit.

Congress might create and empower a national commission on industry-units to act as the body to oversee and administer this general mandate,—this commission having, for example, the power to grant a protocol of integrated operation to an industry which applied and was prepared to satisfy the stipulated conditions for collaborative action. Such stipulation might, for example, include Federal incorporation of the respective companies, agreed accounting and cost accounting procedures, minimum labor standards, prior inclusion in the petitioning trade association or associations of at least 70 per cent of the volume of the industry at the time of application and a comparable proportion of the workers of the industry already in the labor union or unions of that industry and working under collective agreements.

Acceptance of the petition by the commission might under the law serve to give effect throughout the *entire* industry to certain basic terms of the protocol, which would then be deemed to apply; and enforcement of those terms upon the industry would become a matter in the first instance of self-regulation under the representative deliberative body which the industry would be required to establish. Presumably this would mean that terms of employment (subject to regional differences) as these were already embodied in collective agreements, and standards of fair trade practice, would be worked out and required to have industry-wide effect.

This will sound like drastic doctrine, but only so will an industry be enabled to level up its standards of operation without the constant danger of chiseling from the unorganized minority. And the moral pressure upon the recalcitrants to join in seeking the initial petition for the protocol will thus be enhanced. In fact, similar provisions have already been given legislative force in certain English and Canadian developments.

The protocol would also require that the industry would organize for its own administrative purposes under a tripartite body equally representative of employers (or management representatives of corporate stockholders), of organized workers and of consumer interests.

The crucial problem of overseeing the selection of panels and of actual delegates of consumer interests

would be one vital function of the public commission. Methods of choosing and compensating consumer agents would require experimentation. But they should be given substantial powers; and in practice for them to have one third of the votes in the industry-assembly might prove to be insufficient, although in matters of this kind the counting of votes might be less important than the exercise of persuasion and the use of publicity.

For the immediate future, the public policy toward price-fixing or price agreements might well be to leave hands off and see what happens under publicized consumer pressure within the administrative body and under actual consumer withdrawal from the market if prices were unduly raised.

The contention that with this kind of set-up, agreement to raise prices would be inevitable, might prove in actual experience to be valid. But it is equally possible that considerations of self-interest within the industry with the effective voice of consumers in its councils might well lead to policies of lowering prices to maintain and increase volume of sales.

Two other problems of genuine complexity will, of course, have ultimately to be faced. Even mention of them will sound to many like a complete repudiation of our accustomed way of viewing the possibilities of free enterprise. But in an economy which is expanding slowly, the problem of economic utilization of all resources of men, money and machinery becomes different in kind from what it was in a more frontier society. And whether we like it or not, the time has to come in the public interest when organized public attention has to be paid to these two matters because they can no longer safely be left to the completely unregulated play of the market. These two crucial factors are, first, the handling of the problem of marginal plants and of excess plant where there is clear evidence of too much plant capacity. And the second is the method of determining the extent of the introduction of new companies and of new capital into old companies of an industry.

Obviously this is a far cry from the assumed, unimpeded play of competitive market forces. But it is a confession of rational failure and of human incompetence to admit that it is beyond the realm of human possibility to begin to plan, to agree and to exercise some positive economic forethought over matters of capital contraction and expansion,—the total new investment policy of each industry.

We need to remind ourselves that in periods of war

and of deep depression we have already recognized in affirmative ways the need for public interposition in these matters. In other words, whenever we have attempted to view our total economy in a unified way in the public interest, we have explicitly brought public controls to bear on these two issues.

Already in England matters of "redundant" plant in cotton mills are being handled by a buying out of excess capacity and a stripping of the mills. And already the idea that new capital can only be invested under some public controls is gaining a degree of acceptance, as the provisions of the S.E.C. legislation suggest, and as some phases of R.F.C. policy indicate.

To have problems of capital utilization considered in the first instance by an industry operating under a protocol through a representative deliberative body, is perhaps one beginning of a new and more rational approach. Of course, no one industry should have *final* say for itself at this point. Issuance of new capital would be affected with a public interest as related to claims of other industries in the capital market. And eventually a national economy would have to think in terms of the creation and use of a national investment board that would have a certain analogy to and coordinated relation with the Federal Reserve Board. A national investment board may some day be charged to look at the problem of the nation's savings with an over-all view and with constructive interest in the direction of the flow of new capital. This, too, I realize, sounds fantastic. But when we stop to think of the increasing billions of national saving under insurance company control and see how sluggish over a long period can be the private market for new capital, question certainly arises as to the possible need for some new instruments of rational organization in the field of capital utilization.

Again, there will at an early date be presented problems of inter-industry relation and balance. Industries compete with each other with products designed for identical uses (e.g. different building materials) and they also compete in point of their efforts to get a bigger fraction of the consumer dollar. Here are intricacies of the first magnitude. But at the least they can be more fully understood and our factual knowledge of trends in consumer preference can be vastly increased by disinterested study. Proposals for an inter-industry national economic council have been made many times in recent years.² And the proposals arise out of

a sense of felt need for a body, advisory and consultative in character, which would be a fact repository, clearing house and conferring agency for the forces which now interplay blindly in the inter-industry battles for status.

The implication that some degree of conscious economic and social planning is possible, is strong throughout this exposition. But the kind of planning here viewed as possible is not static, authoritarian, down-from-the-top. It implies no regimentation of consumers; nor is it an "all or nothing" planning, however plausible it may sound in cold logic that if we plan in one industry we are forced to extend planning to every industry. Practically speaking, this contention has little force.

What will gradually become possible—indeed is already so, far more than we may realize—is an inductive planning, starting (as now) within a company and building up through an industry-unit body (when constituted under a protocol) in a way which is in fact functional in character, co-ordinative, collaborative, experimental and continuing. If we can get ourselves to think not of planned industries but of planning industries under a measure of autonomy and with occasional opportunity to sit in conference with other industries in a national economic council, we shall approach this effort toward economic rationality with the truly flexible and pragmatic attitude.

Also, if we can envisage industries seeking out this type of integrated action, as they successively find themselves already organized to a point where such action is the inevitable next step in assuring the stability of the industry, we will see this process realistically—see it as a growth voluntarily from within and not as a regimentation imposed from without.

I return, in conclusion, to a reminder of the several elements in the present dilemma. There are certain new criteria to be taken account of if we are to have a productive and democratic organization of industrial effort. There is a felt need for some improvement in the regulative process. There is a proper fear of allowing too many controls over business to become centered in Washington. There is general recognition of the necessity for assuring a proper balance between private initiative, autonomy and enterprise on the one hand and fuller productivity and a far larger national income on the other.

An honest facing of the immediate alternatives and difficulties may well lead in the general direction here

(Please turn to page 37)

² Among the most elaborate of these is the proposal of the American Association for Economic Freedom which can be addressed at the Mills Building, Washington, D. C.

Trends in Cost Reduction¹

By HAROLD B. MAYNARD

President, Methods Engineering Council, Pittsburgh

WHEN today's factory manager looks around for ways and means of reducing factory operating costs, he finds a number of different procedures and systems available, each one offering to save him a certain percentage of his operating costs. If he installed them all and they all did what is claimed for them, he would soon find it necessary to bail money out of the plant in order to have room for continued operation.

It is clear, of course, that all of the procedures and systems offered cannot effect all of the savings predicted if they are all installed at the same time. Nevertheless, most procedures and systems have effected the savings claimed for them when installed alone. The explanation for this apparent discrepancy lies in the fact that many procedures overlap and accomplish the same results although they may be called by different names.

In seeking cost reductions, every individual plant manager should first take stock of the procedures which he is now using. He should decide whether they are operating effectively or whether there is need of a general tune up. Then, he can turn his attention to selecting additional procedures for effecting additional economies.

It should be emphasized at this point that if too many activities are begun at the same time, the effectiveness of all of them is weakened. It takes time to introduce a new procedure, and it takes time for an organization to accept and absorb anything which may be in the nature of an innovation.

In initiating new cost reduction activities, the plant manager is faced with two alternatives. He can choose only time tested procedures, or he can try new procedures which seem to offer promise. Progressive managers should do both. They should lean heavily on well tried procedures for obtaining the bulk of the desired results. At the same time, they should not turn down anything new just because it is new, but rather should give it a more or less cautious trial. To get away from generalities, let us single out a few cost reducing procedures and see how these remarks apply to them.

Methods Engineering

One of the most potent tools for cost reduction purposes is methods engineering. Working methods are the basic factors around which many other activities revolve. The method employed affects the time required to do the job. This in turn affects direct costs. Time is the basis for planning and scheduling. The method also determines the type of operator required. This ties in with personnel work, employee training and job evaluation. Hence, methods engineering may be considered as one of the important activities upon which management may depend for cost reduction work.

According to present-day conceptions, methods engineering includes the related activities of operation analysis, motion study, standardization, time study, wage incentive administration, and sometimes employee selection and training. The field is broad enough to cover all factory activities where an engineering approach is desirable.

Now, although many plants carry on some of the activities which have been mentioned as part of the methods engineering procedure, only the most progressive use them all. For example, some plants have a rate setter who establishes piece rates by estimate. Others use detailed time studies with a gain in the accuracy of the results obtained. If the emphasis is on time rather than study, however, many possibilities for improvement may be overlooked. Hence, those plants which apply the operation analysis and motion study procedures evolve much better methods than those that do not. Even after a good method has been devised, however, there is no assurance that it will be followed at all times unless conditions are standardized and properly selected employees are carefully trained to do the job in accordance with the accepted method. Finally, even when all this is done, the amount of work accomplished may be small and the cost relatively high unless the methods engineering department practices what it preaches and studies its own methods of working and seeks to increase their effectiveness. This leads to intensive training of the methods engineering personnel and the use of standard elemental data and time formulas.

¹ Paper presented at the meeting of the Detroit Chapter of The Society for the Advancement of Management, October 18, 1939.

To illustrate, let us see how a simple forming operation done in a punch press would be handled under the various methods outlined above. In the plant first mentioned, the estimator would look at a drawing of the part or he might, if time were available, observe the job as it was being performed and perhaps measure the overall time for forming several pieces. Then, based upon his past experience and his judgment, and also unfortunately upon a number of purely personal factors such as his disposition at the moment and his like or dislike of the operator doing the job, he would arrive at a rate for the job.

Experience has shown that this method is unreliable and that it does not yield satisfactory results. The only advantage which it possesses is its low cost. Rates set in this way may be set quickly and hence inexpensively. The low cost is more apparent than real, however. An inaccurate standard is expensive in reality and rates set by estimate are invariably inaccurate. Many estimators pride themselves upon the accuracy of their work, but the impression of accuracy comes from a lack of standards with which to make comparisons. In the speaker's experience, whenever a comparison of standards set by time study and standards set by estimate is made, the latter are found to be inaccurate. Even if the general average is good, the fact that some high and some low rates exist causes active labor dissatisfaction. Such dissatisfaction can be costly. It has been found that inconsistent standards even if they are loose cause more dissatisfaction than consistent standards which are tight. Estimating by its very nature causes inconsistencies and hence is undesirable.

Returning to our forming operation, let us suppose that in the interests of accuracy detailed time study is substituted for estimating or an overall check. The time study man will in this case spend perhaps an hour in making a number of stop watch observations and in working up his data. At the end of that time, if he has done his work properly, he will have determined a rate which is correct for the method which the operator used. The first cost of obtaining the rate is higher than in the case of the estimator, but the rate will be satisfactory to all concerned and hence will probably prove less costly in the long run.

The desirability of accuracy in rate setting is beyond question, but all too often that is the only factor considered in time study work. Hence, the method being used at the time the study is taken is not studied, but is accepted as being correct. Where this is done, a major possibility for cost reduction is overlooked.

Our hypothetical forming operation, for example, may be performed by picking up a blank from a stack on a table, placing it in the die, tripping the press, removing the part from the die and tossing it aside into a container. When following this method, standard production is four hundred pieces per hour.

Suppose, however, that the operation analysis procedure is applied before the time study is made. After determining the repetitiveness of the job as a guide to the amount of study which will be justified on the operation, the analyst questions the purpose of the forming operation. "Is the operation necessary?" and if so "Can the operation be performed better in some other way?" In more than one case, asking such questions has developed the fact that the blank and form operations can be combined. Theoretically, the die designers should have realized this, but enough cases are encountered to demonstrate that they sometimes slip up. If the operation can be eliminated altogether, there is no need for detailed time study and costs are reduced to a minimum.

If the operation cannot be eliminated, as is more often the case, there are still many other possibilities for improving the method. Stock may be moved closer to the point of use, guides and gages may be added for easy feeding of the press, an air ejector may be installed, and so on. From the operator's standpoint, the job may be made safer and less fatiguing. As a result of operation analysis and motion study, the methods can usually be improved. In the case we are following, the production rate might be increased to 833 pieces per hour without requiring as much effort on the part of the operator. The cost of the operation would be less than half of what it was before methods study, and although the cost of the study itself would be increased, the savings gained would pay for it several times over.

Passing over operator training for the moment, when the improved method has been established, it still must be time studied to establish an accurate production standard. If a detailed time study is made, it will still require approximately an hour to make it. If, however, elemental data or time formulas have been compiled, an accurate rate may be established in less than five minutes. This is applying methods engineering principles to methods engineering work, and where a large volume of rates must be established, it is a desirable procedure. Again the first cost of deriving the formula will be high, but once available, the net result will be a saving.

From this description, it should be easy for any

organization to recognize its present status with respect to methods engineering work. If the full procedure is not being utilized, it will probably pay to do so. Undoubtedly, the chief deterrent in going into methods engineering work to the fullest extent is the apparent high cost of the work. The plant which does not even undertake estimating has the lowest overhead expense. From that point up, the application of the better procedures means an increasing number of men doing the work. Those who are not used to seeing white collar men around the plant are quite likely to be apprehensive over the increasing overhead. Experience has demonstrated that this is a state of mind rather than a justifiable cause for concern, for methods engineering is a time tested procedure which has thoroughly demonstrated that it pays for itself.

When methods engineering work is properly done, a number of related problems arise which the methods engineer is required to consider. Methods engineering sets up an effective method for doing a job, but if it stops there as it often does, it has stopped too soon. A human being is required to follow the method, and this fact introduces a large number of human problems which are all too often overlooked.

The Human Element

For example, on certain classes of work, the methods engineer always attempts to lay out the workplace for two-handed operation. If possible, he tries to have the method such that the operator works with both hands moving in opposite directions over symmetrical paths. The assumption is usually made that since two-handed operation is known to be effective, the operation will be done effectively. This, however, presupposes that every operator who does the job is capable of performing the two-handed operation which is by no means the case. Similarly, there are many other human factors which although perhaps more obscure than the case cited are equally important in connection with securing satisfactory output. Therefore, the methods engineer must go beyond the consideration of the mere mechanical elements of the job if maximum results are to be obtained.

When we come to the measurement of human aptitudes, we enter a much newer field than that covered by the preceding discussion and one which should perhaps be approached with caution. Nevertheless, it offers sufficient promise to be worthy of more than passing consideration.

Because of the comparative newness of job qualifica-

tion measurement, the place where it fits into the organization is not yet clearly defined. In some plants, it is carried on under the direction of the personnel department, while in others the methods engineering department handles it. The exact place for it is not important in the present discussion as long as it is recognized that in consideration of the human factors, the work of the personnel officer, the psychologist, and the methods engineer come close together.

Perhaps the value of job qualification measurement in selecting properly equipped workers for given tasks can be indicated by a few case examples. In a certain plant, all hiring was done by a comparatively low grade clerk who reported directly to the plant superintendent. During periods of hiring, the clerk would have the applicant fill out an application blank and would ask such questions as occurred to him at the moment. He would then verbally report his findings to the superintendent who would approve or reject the applicant on the basis of what the clerk told him. During one rush period, there was no time for even this procedure, so the superintendent gave the following instructions for hiring girls for a certain class of work: "If the girl is big and strong hire her. If not, don't."

Such instructions have the advantage of simplicity, but that is all. A big strong girl may or may not prove to be satisfactory for the work at hand. She may be too dull for it, or equally undesirable, she may be too bright. She may lack endurance, may be susceptible to monotony, may not be properly motivated to take an interest in the work, and so on for a long list of general characteristics. With regard to specific qualifications, she may lack hand-eye co-ordination, finger dexterity, visual acuity, or other aptitudes required for the job. We could as well substitute for "big and strong," the words "brunette" or "blonde" or "last name beginning with K" or any other arbitrary classification with an equal chance of securing suitable employees.

This same plant eventually became interested in better methods of employee selection. A job qualification measurement set-up was made, but the instructions were to hire everyone who had no obvious physical or mental defects. In hiring, however, an attempt was made to specify the type of work the new employee seemed fitted for and to note on the interview record any points of interest which were observed.

The new employees were carefully observed during the probationary period. Whenever an operator had definitely proved herself to be incapable of doing the job,

her foreman was required to state his reasons for wishing to transfer or discharge her. A comparison of the reasons given with the interview record proved interesting. In the majority of cases where the operator failed to make good, it was found that she had been placed on a job by the foreman other than the one suggested at the time of hiring. In one instance, the interview card bore the note, "Capable girl, but will probably prove to be careless worker due to lack of motivation." The report turned in by the foreman six weeks later read, "Seems to be good worker, but produces too much scrap."

In another case, a female machine operator was summarized as "not too desirable, very low co-ordination." On the job she averaged about 30 per cent in the twenty-two days she worked. A qualified operator possessing the co-ordination essential for machine operation is expected to average about 80 per cent over this period.

In contrast, another girl who was found to possess excellent co-ordination was recommended for machine operation. She finished her learning period two weeks ahead of schedule, or 30 per cent above standard rate.

A male employe was released at the end of his probationary period with this note on his personnel card, "No good." Upon further questioning, his foreman remarked, "Wouldn't work, shiftless, and just generally no good." His interview summary read, "Desirability questionable. Qualification measurement results and motivation below average."

Another male employe was released with the comment, "Discharged for smoking." The "No smoking" rule was emphasized from the time the applicant walked into the factory. The interview bore the note, "Not desirable, nervous, bad teeth, low in qualification measurement results." Thus, his nervousness, poor teeth, and low performance were a warning of instability, both physical and mental which later showed up in the form of consistent rule breaking.

Another male employe quit after several weeks working. He had been described as especially desirable with highest qualification measurements, but with the warning that he was probably too good for the job on which he was placed. The warning proved correct. People with high ability usually seek expression, and if curbed, become dissatisfied and usually search elsewhere for an adequate outlet.

These and similar cases show that much may be saved in the way of hiring and training expense and scrap work if sound selection methods are used. A

given job requires certain characteristics and aptitudes. If the aptitudes required for the job are known and the extent to which a given operator possesses those aptitudes is measured, than probable success on the job can be predicted.

A study of the extent to which a given aptitude is possessed by a group of people reveals that there are large individual differences. A sense of spatial relations, for example, the aptitude required for judging distance, size, etc., is essential on certain classes of assembly work. There are individual differences in the ratio of one to six. Operators who possess this aptitude to a marked degree may make successful assemblers. Those who do not simply cannot do the work. While it is relatively easy to measure the spatial relations aptitude, it is impossible to discover it by merely looking at the operator. Therefore, it may be seen that the observation of appearance and the satisfactory answering of questions on the application blank may be practically worthless when it comes to hiring for specific jobs.

Another point becomes alarmingly clear when an understanding of the extent of individual differences in aptitudes is known. The lack of a particular aptitude on a job requiring it may represent an accident hazard. On a job like running a punch press, the lack of hand-eye co-ordination may result in a serious injury. Therefore, job qualification measurement usually acts as protection to the worker through the elimination of this type of hazard. In those organizations where seniority is used as the basis of placement, the specific qualifications of the operator are not commonly considered. This introduces a hazard which is undoubtedly unrecognized by those who have never considered the matter in the light of the findings of job qualification measurement.

Training

With a good method devised and with a suitable operator selected for the work, there is yet another step to be taken before the job can be considered to be completed. The operator must be trained to do the job in conformance with the prescribed method. Here again the field of the personnel man and the methods engineer converge. Each may use a somewhat different approach depending upon his own background and existing conditions, but each has the same objective in mind; namely, to bring the operator up to the point of standard performance as quickly as possible and with a minimum amount of scrap produced.

It may seem that the above overlooks the foreman who has been and is the one who usually does the instructing of operators. This is not so. If the foreman in the first place is selected partly for his qualifications as a teacher, if he understands effective training methods, and if he has the time to devote to training activities, he can probably train new employees satisfactorily. Few foremen satisfy these three requirements, however, and therefore, the training job naturally devolves upon those who do.

Of the many training procedures which are available, one has been so outstandingly successful that it is worthy of more than passing notice; namely, the training of new operators by motion pictures. The value of the motion picture camera in training operators for repetitive work requiring a high degree of manual skill and dexterity can scarcely be overstated. Where unsystematic verbal instructions are given, learning time is necessarily long and may extend over a period of weeks or even months when the operation is complicated. In addition, there is no assurance that the new worker will learn the best method, provided that method has already been developed. Minute discrepancies due to variations in individual characteristics and ability of the learner are almost certain to creep in, and these will prevent the worker from turning out the maximum amount of work. If the best method has been deter-

mined, it can be photographed. A single cycle can be made which can be projected continuously, thus giving the effect of the operation being performed over and over again. In training a new operator, the instructor first shows him the picture, explaining any special points that need emphasizing. The picture is shown a number of times at varying speeds until the operator is thoroughly familiar with it. He is then permitted to try the operation, and if considered advisable, the film may be projected in front of him, so that he may have it for a guide while learning.

This procedure may seem costly at first because motion pictures are used. Actually, when motion picture equipment is available, it is one of the least expensive means. The cost of film for an ordinary short cycle operation need not exceed about seventy-five cents. The learning period of the operator is reduced on the average in the ratio of approximately seven to one and in addition, because the film does the teaching, the time of the instructor is greatly conserved.

In conclusion, the foregoing remarks may be summarized briefly by saying that additional cost reductions may be sought by doing better some of the activities which are already being carried on in most plants and supplementing them with some of the newer procedures, particularly those dealing with the human element.

SPRING CONFERENCE

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A Dialogue Between Two Authors

By MORRIS L. COOKE

Consulting Engineer

and PHILIP MURRAY

Chairman, Steel Workers Organizing Committee and Vice President, United Mine Workers of America

This dialogue is excerpted from the novel concluding chapter to a recent unique volume "Organized Labor and Production," (Harper & Brothers) which has been written by Morris L. Cooke, well-known management consultant and member of this Society, in collaboration with Philip Murray, Chairman of the Steel Workers Organizing Committee of the Congress of Industrial Organizations. After their joint chapters had been written, treating of the problem of improved methods of co-operation between management and organized workers, these two men engaged in an actual colloquy of which this article is a somewhat abridged transcript. Permission to reprint is gratefully acknowledged.

COOKE: Now having reconciled our essential differences let us emphasize further our common ground. Where do you think we should go from here? What are the next steps?

MURRAY: Before we go much farther on our travels along the road of collective bargaining, we'd better send someone back to pick up the rest of our party who missed the train.

COOKE: And who are they?

MURRAY: What I mean is this: the labor movement in the United States embraces, at the most, 8,000,000 wage earners who have reached various stages of development in organized relations with management. But three times as many more workers have been either forgotten or ignored by unionism or restrained by reactionary and lawless employers. Our next step, therefore, is to lend a hand to these people and to help them join the parade. If we go on without them, we are going to find ourselves at some time dragged down by their lower standards and at another advancing at their expense. We have experienced both already. The real split in labor is between the organized and the unorganized.

COOKE: What steps would you take?

MURRAY: The next step is the recognition of the interest that labor has in the conduct of business. Today the ownership of industry is sharply separated from the control. The stockholder usually has no voice whatsoever in the administration of his company. Only an exceedingly small percentage of them can or do attend stockholders' meetings. Proxies are gathered by the management at corporate expense. Management has

usurped the prerogatives of ownership and is in fact responsible to no one but its patrons, finance capital. When management resists labor organization, it is fighting to preserve this usurpation at the expense of the ownership.

The next step, therefore, is to raise ownership and labor to a common level with management, and when this is done, we can take the next great voluntary move forward in the solution of the problems of unemployment and job security. If this effort fails, then government regulation, either benevolent or fascistic, is the only road remaining.

COOKE: That's fine, Mr. Murray. Now—"answer me another!" I am completely convinced that right here in the United States will be enacted the next important acts in the drama of man's development of a well-balanced civilization. Anything which tends to confirm this possibility greatly excites me.

MURRAY: You're optimistic. I hope you're right. But what is it?

COOKE: Two things have become clear and another has happened which three taken together spell, as I see it, a fundamental change in the situation. First, unemployment in all developed countries is now looked upon as a chronic condition. The civilized world may never again have a scarcity of labor quite in the sense heretofore known. Second, with machine power and machine skill largely supplanting hand labor and craft skill the old craft idea on which labor has been basing its hopes since the beginning of the industrial revolution loses much of its potency. Third, the passage of the Wagner

Act opens the door wide to a new twentieth-century opportunity for labor. Have we, in your opinion, arrived at such a point in the evolution of industry and labor as to promise for the future a life for the workers, and a productivity for industry, far above anything we have known in the past?

MURRAY: Yes, I think we have. These last depression years have been the crisis. The world has had to choose a course of action. The complacent individualistic excesses of the 1920's were out of the question as long as the effects could be remembered. South America turned to revolution; England to Tory government and Germany to National Socialism. France elected a Popular Front which disintegrated more rapidly than it was formed. In the United States we tried to widen the application of democracy, at the same time placing restriction on its abuse. Here the emphasis was on protecting a labor organization's right to exist and function, and thus directly take a part in controlling its destinies. Its success in this has been fully discussed in this book. It has been so successful that it will survive any change in the conditions which made its rapid growth possible. We are now in a wave of reaction. Many states have already drastically revised or repealed their "Little Wagner Acts." Yet labor continues to advance, with its three most notable victories in Wisconsin, Michigan, and Pennsylvania in spite of their having been the first states to abandon the New Deal.

COOKE: You think then that we have progressed.

MURRAY: Yes, we have arrived at such a point where the promise is hopeful for the future you envision.

Now, Mr. Cooke, I would like to get your reaction to a problem that constantly bothers me.

COOKE: I can't guarantee an answer, but I'll try.

MURRAY: The standard economists tell us that technological unemployment is a myth or at worst a temporary inconvenience, resulting in more jobs later through cheaper products. But the workers who lose their jobs, the communities which become ghost towns—Martins Ferry, Ohio; Mingo Junction, Ohio; New Castle, Pennsylvania; Creighton, Pennsylvania; for example—have been somewhat neglected by this school of thought. When an entire plant is shut down, as has frequently been the case following the introduction of the almost automatically operated continuous strip mills in steel, the average age of the displaced employees is high, usually above the hiring limits in the industry. These men have, for the most part, given long service in a process which is now obsolete. Even if new jobs were available, the companies refuse to transfer most

of them on the ground that they are too old to learn a new occupation. I understand that the telephone industry is attempting to alleviate the suffering caused by this problem by introducing dial systems only to the extent that their switchboard girls naturally retire from service. Without affecting the advance of industrial techniques, do you think that the welfare of labor also ought to be a major consideration when new machinery is contemplated? If so, in view of the vast importance of the problem, how would you go about attempting to solve it?

COOKE: Now you have posed the most important, perhaps the most difficult, problem of all. Considering it as a deep-seated disease, the faulty manner in which we have integrated the new technology into our society can, I believe, be remedied by combining patience with vision and positive remedial action, but not by the application of any quick-acting liniments or poultices.

MURRAY: What are some of the better remedies?

COOKE: First let me paint the picture a little more clearly. The economists—with the exception of a few among the older of them, and most of the younger generation now coming to the front—have been more scholarly than realistic. Economics began as an interpretation of the economic experience of the day. It was good interpretation, and led to generalizations, called principles. An initial error was the assumption that these principles were enduring natural laws instead of inferences based on practices of the day which were sure to change. The second error of the economists was to continue teaching these principles as natural laws, without adequate modification of them, while the structure, institutions and practices of economic activity were changing profoundly. The result is survival of an "economic science" that does not fit.

MURRAY: You're right about that, Cooke.

COOKE: A hundred, seventy-five, fifty years ago our economy was in process of expansion through discovery and settlement of new areas, and the exploitation of new resources—a vast store of new capital. This exploitation made new jobs so fast—jobs of a kind that did not require highly developed skills—that workers displaced by technical advance were promptly re-absorbed. And it is a historic fact that the new jobs—the expansion—created such purchasing power, and technical improvements in a competitive system so lowered prices, that the industries in which the technical improvements were made called for an increasing number of workers. Generally, although displaced workers suffered temporary inconvenience or even distress, within a short time they

had new and, frequently, better jobs in the expanding economy.

But these things have changed. Improved technology has been introduced into economic society at an accelerating rate; at the same time the expansion of the economy has been slowing down. New areas are not being discovered and settled; new resources are not being appropriated and exploited, thereby creating new jobs. And in the older industries concentrations of control of capital, and of effective control of managements, if not literally of ownership, have made possible the destruction of vital parts of the competitive economy through various kinds and degrees of price maintenance, thereby diminishing expansion and new jobs. Many displaced workers today suffer not merely temporary inconvenience and distress, but are pushed into a rapidly developing class of irregularly employed or of a permanently unemployed proletariat.

The situation is ominous and the problem gigantic. It means an attack for solution along many fronts.

MURRAY: Well, I ask again, what are you going to do about it?

COOKE: Perhaps, to begin with there should be a regulated, better-measured introduction of the new technology such as you have stated is exemplified by the American Telephone and Telegraph Company. In another case I know about there has been a deliberate retarding of progress pending the development of increased demands for existing products and for new products. It may be said that the company has been deliberately "soldiering" in the interests of its employees. Fortunately, this company is in a financial position to do this and is looking ahead at least a generation rather than being concerned with immediate savings. Such procedures are praiseworthy and should be followed more generally. However, they are not generally applicable and are possible only where an industry is controlled by an essential monopoly; otherwise some competitor will try to get the jump on the others by going the limit with new devices and thereby force the others to come along. Also a monopoly may not act so wisely as in your illustration. One trouble in the steel industry is that a great dominant corporation has for years withheld discarding early equipment as depreciated and obsolescent, and is now proceeding to correct that situation all in one move.

Therefore there must be regulation of the introduction of new technology, not by the sum of the decisions of separate enterprises, but in a broad way under supervision of the public, which means of its government. It

means some degree of regulation, not only of the introduction of new devices, but also of capital formation, investment, and additions of plant and equipment to industries. It means especially renewal of expansion of the economy through restoration of price flexibility throughout the economy. If this cannot be accomplished directly by legislation governing monopolies—and it is doubtful whether it can—then we must resort to wider applications of the yardstick principle of control of the price structure of each faulty industry by competing public or non-profit co-operative enterprises. Some other people in countries that remain most democratic, such as the Scandinavian, are working it out this way. They are small countries and are managing it much more easily than we could, but we have the problem and they have shown us the most effective way thus far.

MURRAY: It is clear that we must work for improvement on a wide front. You evidently agree with me.

COOKE: Yes I do, but to one statement you made a moment ago, Murray, I must take violent exception. You say, "even if new jobs were available, the companies refuse to transfer most of them on the grounds that they are too old to learn a new occupation." Any such claim by management is pure bunk. In a plant operated under Scientific Management such an alibi would not be valid. No man before pensioning age should be regarded as too old to learn a new occupation provided he is afforded proper instruction, if the work is properly planned and if he is not assigned to something which is beyond his mental and physical capacity. This is the definite practice of every Scientific Management plant.

MURRAY: Labor, in other words, must come first.

COOKE: Yes, the welfare of labor, which is the bulk of a nation's citizenship, is the primary consideration. Its welfare must be maintained at all costs. The least cost is through greater productivity which calls for jobs for all. Industry should include in its plans for change the human as well as the mechanistic factors involved, and this means that the individual employer should lay as definite plans for the full utilization of his working force as is at all feasible. But it must now be recognized that greater productivity is a problem of expansion of the economy through wise and measured collective control, now that expansion through discovery and exploitation of new geographical frontiers has come to an end.

Changing the subject, it is my experience in negotiations growing out of collective bargaining that the union representatives frequently require expert assistance. Do you see any disadvantage in using a company's funds

in paying for such services if it is fully understood all around and the union is untrammelled in choosing the experts?

MURRAY: In the light of union experiences to date it is pretty difficult to visualize any company willing to provide funds for the employment of expert assistance by a union, which in turn would use same in the collective bargaining process. As I see the situation, there must be much more complete and full acceptance of unions as an integral part of the productive process by employers before any such arrangements can be either practical or possible. Given the now generally prevailing lack of confidence among our members in the good faith and sincerity of most employers in dealing with unions, union members would be inclined to question the accuracy of any data and the impartiality of any expert whose services were made possible by funds provided by an employer.

No, if union representatives require assistance they will provide it themselves. Indeed, union officials in some fields are recognized as the foremost experts in the industry. Gen. Hugh Johnson, some months ago, ran a column in his newspaper syndicate praising John L. Lewis as the best informed mind either as operator or worker in the coal industry. Then too, most unions have established their own research departments.

I am often asked how we can expect labor to plunge wholeheartedly into high productivity so long as there are many unemployed—so long as we have these periods of depression and the loss of jobs and savings. We all know that many jobs now done with a steam shovel would give more people some semblance of a living if done with hand shovels. But to do it would lower the standard of living—the standard of living, of course, varies directly with productivity. What is the answer?

COOKE: Of course you know the answer. There is some sense in thinking an average lower standard of living, with everybody living and self-respecting, to be somewhat better than an average higher standard with ten to fifteen million unemployed and on public charity. There was something noble about the self-sufficient community of the great-grandparents of living Americans, even though they wore homespun and didn't have telephones, autos and movies. A higher standard doesn't mean merely a higher average; it means a higher average of well-distributed incomes. This is not an average got by adding \$25,000 to \$1,000 and getting \$13,000; but an average got by adding five at \$2,000, four at \$2,500 and one at \$6,000, which likewise is \$13,000.

Our problem is one of securing as high a standard of

living as possible, and the only way is by high productivity. At the same time we must secure the high standard under conditions of equitable—not equal, but equitable—income, with everybody sharing according to his ability to contribute.

This means organizing our economic process so that every bit of work done on individual initiative, and the supplementary work done on public initiative, meets a genuine need; does not represent speculative over-investment or speculative over-production with existing investment. Balance is what is needed. Given balance, the economy will expand automatically from innumerable individual efforts. Keep everybody busy and reduce, if not absolutely eliminate, unemployment. This does not mean a static society. It means, rather, a growing society, a society progressing, but kept in balance.

We must remember that while human wants are limitless as a whole, many are limited at any particular time. What people desire—the proportions—change gradually. Production should be such as to meet balanced demand; and investment in facilities should be such as to provide balanced production facilities.

Now that we are trying to be quite frank with each other may I say that nine out of ten businessmen I meet, the moment labor unions are mentioned, immediately refer to what they call their "excesses." You must have a stock answer for remarks of this kind. What is it?

MURRAY: Employers generally get the kind of labor relations they ask for. If the union indulges in "excesses," then the employer as a rule has no one but himself to blame for it. For instance, if he engages the services of labor espionage agencies, if he stocks up his plant with tear gas, hand grenades, sub-machine guns, black jacks, rifles, and other implements of war, if he hires high-priced lawyers to harass the union before the Labor Board and in the courts, if he distributes to his foremen anti-union literature and lets it be known to them that any harm they can do to the union would be forgiven by him, if he contributes to anti-labor organizations, if he quibbles over words, if he refuses to consent to an election or to sign a contract when he knows the union has a majority, if after a contract has been forced from him he delays and hampers the settlement of grievances, if he continues to discriminate against union members, then labor will answer in kind and nine out of ten businessmen, viewing it from afar, will say, "Ah, another 'excess.'"

Take the Steel Workers Organizing Committee. During the early days the SWOC encountered consid-

erable opposition, but among those companies which negotiated signed contracts with the SWOC and which sincerely and wholeheartedly entered into these agreements, no one has been able to say that the SWOC has gone to "excess." Indeed, the steel workers' union is constantly referred to as a model of respectability and intelligent relations. The Jones and Laughlin Steel Corporation had fought the union in 1936 and the early part of 1937. As a result the union was forced to strike in order to gain recognition, but after the strike a new era opened. The company abandoned its anti-union policy and embarked upon a sincere experiment in labor relations. As a result the Jones and Laughlin Steel Corporation is enjoying a period of harmonious labor relations. There are no "excesses" at the plants of this company. Indeed labor relations here have become a model for the entire industry. A booklet has been published describing them.

The point is that when companies oppose unions, the unions elect as their leaders belligerent and willful men. No other type could survive. If, on the other hand, the company does not oppose the union with unlawful methods, the union is likely to choose for its leadership men noted not for their fighting qualities but for their ability as negotiators. This more than anything else accounts for the businessmen's reaction you refer to.

Now, Cooke, I have seen so many vexing problems solved by getting the facts and then weighing them dispassionately that the Scientific Management approach as practiced by you and your colleagues makes a strong appeal. Yet under the guise of "scientific management" many practices have been put into effect which were less scientific than extortionate. That is, instead of finding a better way of doing things the new management methods discovered how to get more out of labor without a proportionate return. As a result of this abuse, wage earners generally hate and fear the efficiency expert. What do you suggest be done about it?

COOKE: I am glad you asked that. It is a very pertinent question. However, the terms "Scientific Management" and "efficiency system" should not be used as synonyms. The objections of the wage earners is not an objection to Scientific Management, but to something which masquerades thinly disguised as Scientific Management, or "something just as good." The management engineer who tries conscientiously to follow the true Scientific Management techniques and principles shudders when the term "efficiency engineer" is applied to him, because of the unsavory record of the latter term, which has been used to cover a multitude of sins.

The profession of management engineering, like the professions of law and medicine before they had developed scientific standards, has had its deep fringe of quacks and shysters. Occasionally they have used the term "Scientific Management," but more generally the term "efficiency engineer" as having a better sales appeal, being less high-brow, and more related to something the typical businessman understands—efficiency.

The engineer who represents genuine Scientific Management painstakingly attempts to discover and evaluate all the facts bearing on a managerial situation, including those pertaining to labor's interests, and then seeks to devise a system of management which fits the particular situation. No two of these systems are ever alike in detail because no two managerial situations are ever alike in detail. The efficiency engineer, on the other hand, rushes through some preconceived or hastily devised system, with his weather eye always on the interest of the employer who pays his fee, gets the job done quickly, collects his fee, and rushes on to the next job. The former is creative of something enduring because it fits the situation in respect of every element; the latter is highly commercial.

MURRAY: The name doesn't interest me. It is what some of these so-called experts do to labor.

COOKE: The conditions you refer to frequently occur where incentives are fixed by foremen or others without adequate time studies or where the time studies are improperly made and without due regard to operating methods. Wage earners should see to it that practices which involve wage payments and other operating setups are developed in such a way as to include in the research all factors which are rightly involved. This is true Scientific Management. This necessitates: (1) a production control that will distribute the work equitably and eliminate lost time; (2) development of standard methods along with the introduction of production control; (3) studies of fatigue where this is involved; (4) training of the operatives to work in the easiest way; (5) increase in pay where increased effort or skill is required—all carried on with the full knowledge of the workers affected.

As in so many other situations, education is a large part of the answer, particularly of executives and all others in financial control of industry, as well as of the men at the head of organized labor and all their subordinates pretty well down the line. Education of the workmen, I think, will be relatively easy. The pity of it is that most of the people in control of industry are too lazy to take the trouble to understand Scientific

Management and too ignorant to distinguish between it and the superficial makeshifts of the "efficiency engineers," who seem to offer an easy way with little or no responsibility placed upon management. No management engineer worth his salt ever suggests that the introduction and gradual development of Scientific Management is either a short-time proposition or easy of accomplishment. The ends to be accomplished are too important and far-reaching to make it an easy job. Taylor advised employers, "Don't start unless you are ready to stay with the development for at least five years!" One of the best management engineers I know does not begin time studies during the first five years.

MURRAY: It's a serious confusion that you point out.

COOKE: Every party at interest must bear a share of responsibility for this confusion between Scientific Management and the numerous varieties of "just-as-good" substitutes: The Scientific Management engineer, because he has been too technical, too summary and one-sided in his explanations; employers, because they have thought too much in terms of lower costs and too little in terms of human relations; labor, because it has failed to make serious and sustained effort to learn the distinction between true Scientific Management and "efficiency."

MURRAY: What should be done about it?

COOKE: What should be done about it! The obvious, simple, direct, step is for organized labor, progressive employers, and professionally minded engineers to get together to put management engineering by whatever name you call it on the dissecting table, and as a result of such laboratory work put on record so that everybody can understand, the anatomy, physiology and pathology of management engineering. You should have in mind that there is already a rich literature of Scientific Management easily available. A reading of the Bulletin of the Taylor Society¹ affords quite an education as to the best in management. Quite a few labor leaders have contributed to it.

MURRAY: I hope you can get them all to read it.

COOKE: Now, let me ask one, Murray. It's this: assuming a time when labor's fight for organization has been pretty generally won, what in your opinion will take the place of the "scrap" in keeping up rank and file interest in the labor movement?

MURRAY: As I pointed out in answer to your first question, labor's fight for organization is not pretty generally won; but applying this thought to those industries where substantial recognition is being achieved I

would say that the thing labor has been fighting for from earliest days will take the place of the "scrap" in keeping up rank and file interest in the labor movement. The need for battle to stimulate support is one of the popular fallacies of unionism. The Amalgamated Clothing Workers, for example, have not had a major strike in years; yet member enthusiasm is as great as ever. It is just as easy, and far more desirable, to arouse fervor for the fundamental work and accomplishments of unionism as it is to hold a picket line. In fact, one of the results of a walkout is a heightened interest in carrying on the real job of collective bargaining.

The rank and file is more concerned about pay and job security than about "scraps." A liberal seniority clause is more exciting than a soup kitchen. The point is that there are "scraps" only because they are necessary to bring about certain gains. And as they become no longer necessary the energy they consume will be diverted to more useful channels.

No artificial device is needed to keep up interest in the labor movement. The desire to enjoy a democratic, reasonably secure and comfortable economic life will always be the main source of rank and file interest in the labor movement. Now let me ask you a question.

COOKE: Go ahead.

MURRAY: American industry today is split into two camps: those which have accepted collective bargaining and those which still actively resist it. Because a single anti-union company may imperil the constructive unionism in conjunction with advanced employers, such as we discuss in this book, do you not think it is the responsibility of all of us to bring the old-line reactionaries into line?

COOKE: The law of the land being what it is, there can be only one answer to your question. The means by which more general collective bargaining is to be brought about is the problem. We *should* be able to rely on social pressure to influence a wider observance of the law, but something tells me that little help can be expected from this direction. Our principal purpose in writing this book was to demonstrate to the open-minded that collective bargaining works—that the net gains are worth all the effort needed to put the system into effective operation. The experiences and testimony of labor leaders and employers who have satisfactorily tested out the system should be influential. To get these arguments before the American public perhaps an association would be useful. Its board might be constituted on a fifty-fifty basis of employers and employees with a sprinkling of economists, engineers and other special-

¹ The predecessor publication to ADVANCED MANAGEMENT.

ists. The meetings would afford a forum in which model contracts and progressive techniques could be publicized and difficulties discussed. There would be many ways in which such an organization could not only increase the total volume of collective bargaining but qualitatively improve it as well.

With your familiarity with labor's past struggles I need not tell you that our principal dependence for the extension of collective bargaining must be placed on labor's own activities, on its insistence on collective bargaining and its efforts to make its practice serve broad social purposes.

Now, my friend, do you allow yourself to speculate on probable trends in case we are unsuccessful in having

collective bargaining generally adopted somewhat after the plan recommended in this book?

MURRAY: I don't like to speculate on the probable trends in case we are unsuccessful in putting over collective bargaining somewhat after the plan recommended in this book. It is too dismal an outlook. We are just leaving a period in which collective bargaining was scarcely ever really accepted. Employers dealt with unions only because they had to. If we go back to such conditions now in view of the present worldwide attacks upon democracy the outcome may well be a weakening of democratic processes here and a possible setting of the scene for a dictatorship. If American political democracy is to survive, we must succeed. We must have democracy in industry.

Is Industrial Self-Government Possible?

(Continued from page 25)

outlined for the good reason that other available alternatives seem to promise to satisfy far fewer of the desired aims. If we do not intentionally move in this direction, what direction shall we take, and still apply democratic principles to the conduct of industry?

For the values that may be forwarded in the industry-unit approach seem to be the following. It encourages existing economic influences into overt expression under the voluntary, representative, autonomous agency of a democratic, representative industry assembly. It assures ultimate public control over the basic policies of such an assembly when an industry is ripe for (and can be publicly encouraged to) more completely integrated action. The power of the Federal Government is invoked at the level of ultimate policy, not at the level of particular interference, or futile or uninformed regulative intervention.

Individual corporations which are well managed are disturbed in their autonomy to the minimum; badly managed plants—socially wasteful—are brought to terms under legitimate, semi-public pressures. The collection and use of factual data about markets, inventories and all the rest, become more than ever essential and practical; the facts are brought into the open and decisions can be more scientific because better informed. The internal organization of an industry has a reasonable degree of democratic controls; the external relations of an industry get increasingly a degree of democratic consideration through a national economic council.

Stated in other terms, does not this line of approach—as it might build up over a generation—tend to temper the centralized power of government, assure some reasonable freedom within industry, build up a constitutional structure over our economic life, yet enable the public, consumer interest to assert itself when crucial decisions are required? And does not this represent within the world of industry an inductive, functional and dynamic start at planning which can combine realism and rationality?

I do not have to be told that all this is something different from the private capitalism we have known. But that it may be a next step for some industries which are perhaps more ready for it than we surmise, is not unlikely. I repeat that this is not a blueprint nor a panacea. I agree that there is room for a variety of formulas to be worked side by side. But I also contend that at present our public economic policy is essentially stalemated. I agree with the attitude and mood of John Chamberlain in saying:

Democracy is only possible in a society of various groups and classes, a society of many available alternatives. . . . Students of society should forget the political boss and concentrate on the pressure (organized) groups behind the boss. The labor union, the cooperative, the institute and the syndicate—these are the important things in a democracy. If their power is evenly spread, then society will be democratic. For democracy is what results when you have a state of tension in society that permits no one group to dare to bid for total power. (*Saturday Review*, November 12, 1938).

Price Levels and Prosperity

By JOHN E. WEBSTER

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INDUSTRIAL engineers are justified in their chagrin that while they, with the help of shop supervision, have been largely responsible for an annual increase in industrial productivity of around 4 per cent we have for the last ten years produced, per capita, 16 per cent less than during the previous decade. Thought has been given to the development of methods and equipment which make it possible for one man to produce what formerly required two, but the solution is not complete until the two actually increase their production instead of one of them joining the ranks of the unemployed.

All reform movements are outside efforts to correct industrial failures. Industry must bear with these outside irritants which are a result of its internal disease while it looks to its own obsolete methods. Industry must take steps to assure itself a constant full-time job which means a market for its normal capacity production. Anything which interferes with industrial growth and full capacity production is a curable disease.

The regulations which we have imposed upon ourselves to keep our health have resulted in greatly enlarged personal freedom. The self-discipline needed to free industry of the depression germ will not interfere with the striving for legitimate long-term profits which should be and can be much higher than they have been under the present cycle-dominated economy.

The growth of industry has been so rapid, due to the favorable environment of a new continent and a people free from all the restraints of old civilizations, that it has as yet not recognized that it is a unit rather than a host of not-so-rugged separate industries. The prosperity of steel is dependent partly on its own efficient production but to a much greater extent on the total national income which creates a demand for rails, buildings, autos and household appliances. Central station efficiency is important to our utilities but more important to them is the industrial payroll which means power consumption and prompt payment of bills. The farm problem can be solved only by a co-existent demand for industrial workers which will provide an escape for those existing on marginal farms, and by a greatly enlarged market for the more expensive and better foods and clothing which would result from general industrial

prosperity. A price and sales policy of one unit of industry that results in the absorption of more of the national buying power than it currently releases is detrimental to the welfare of all the other units. It has been a common saying that each producer should "tend to his own knitting" but no enterpriser is "minding his own business" unless he is concerned about the price and sales policy of all other units. The unit producer has concerned himself, through his trade association, in establishing the price and sales policy of his line of product on such a basis as would give him and his industry the largest possible share of the current national income, with no thought given to methods of increasing and stabilizing that income. The trade associations must combine in an over-all national industrial association to deal with the problem of constantly increasing the national income because it determines the national industrial market.

Such a national industrial association in analyzing the problem will soon approve the cycle theory as advanced by the Brookings Institution and which Mr. Guy Greer, in his article in the December 1939 issue of *Harper's Magazine*, states has been proved to be correct. This theory is that during periods of high production, industrial profits increase rapidly and go sweepingly to the high income groups which do practically all our national saving. These high savings are in excess of the normal need and demand for plant expansion, and they are in large part not currently spent. The withdrawal of the unspent savings, amounting, according to Brookings, to some eleven billions in 1929, so restricts the market that stocks of goods increase, production slows down, payrolls are smaller and the down swing of the cycle is started.

To get a clear picture of the above, we should give attention to the typical industrial break-even chart. While all production units may not plot these charts, they all know that they must have sufficient orders to fill 50 per cent, 60 per cent, or 70 per cent of their normal capacity to keep out of the red. This break-even point is at about 55 per cent capacity for the average unit. Above the break-even point profits increase much faster than production due to the fact that some items of cost; namely, direct labor, materials and trans-

portation, are directly proportional to production while depreciation, bond interest, preferred stock dividends, rents, property taxes, insurance, plant maintenance, heating, lighting, supervision and sales are only slightly influenced by volume of production. For instance, according to press releases, the break-even point of steel is, at the present prices, near 50 per cent of capacity and the profits at near 95 per cent capacity, are at the rate of ten dollars per share.

With production below the break-even point, as it was in the early thirties, industry pays out more than it takes in. Brookings reported for these years an overpayment of twenty-nine billions while Machinery and Allied Products Institute reported 34.5 billions. These industrial contributions to the national buying power at least help to start the cycle up swing.

During the last ten years the center of gravity of the cycles has been at a production of about 63 per cent of national industrial capacity. Apparently at this point all money paid out for the production and distribution of goods and services is currently spent for new production. Savings (due to the low profits which have averaged for ten years but 1.7 per cent on total corporate investment, and the consequent restriction of high incomes) have been limited to the average amount spent for new construction. The important conclusion can now be stated. If we can obtain the same per cent distribution of the total receipts from the sale of goods and services when operations are at 95 per cent to 100 per cent capacity, as we have averaged during the last ten years while producing at 63 per cent capacity, we can expect that the high capacity will be maintained.

The break-even chart shows that unit costs decrease as production increases. Our economic instability comes from our endeavor to keep a stable price based on a unit cost which varies with every change in the rate of production. We must introduce a factor in our economy that will cause prices to follow costs as they are reduced due to increased production or technological and managerial progress. Industry is now (December 1939) under pressure from the TNEC and the public and with considerable evidence of righteousness, slightly resisting the urge to increase prices. Holding present prices is not enough. They should be lowered with costs and once lowered, they should never come up, as costs should continue to go down due to increased productivity.

If goods are priced to give a distribution that will cause all money received to be spent for new production when production is at 60 per cent of capacity, we

obviously get a production of only 60 per cent of capacity. If we want an average production of 95 per cent of capacity, we must price our goods and services so that we will get the correspondingly higher distribution which will still cause all income to be currently spent for new production. In other words, we get the rate of production for which our prices are set.

The problem is to get the simplest possible price control that will give full employment and as near full capacity production of desired goods and services as full employment will allow. And this must be done before our liberties are lost in some form of totalitarianism. We may try one or more of the following plans:

1. Leave the problem as it is now in the hands of individual producing units, hoping that they will, under pressure of an aroused public opinion, voluntarily keep prices at a point which will give full employment.

2. We may do as the Swedes have done; i.e., build an immunity to monopolies and high prices by the development of competing co-operatives.

3. Depend on the government to define and enforce the desired prices, or to prevent over-saving by taxing the high income groups to the point where they cannot over-save.

4. Encourage all producing groups to unite in formulating and adopting a code with the objective of full employment and the maximum possible production.

Let us consider each of these.

Individual Action

The amount of business going to any line of product is determined almost entirely by the total national income rather than by any policy that may be adopted by those in control. There is no incentive for any industry to lower its price in order to increase its volume unless it is assured that all other producers will do the same simultaneously in order to increase total volume. An individual producer can increase his share of the going business by better price, quality or salesmanship. But that these efforts have little effect on the total volume of his line is shown by the fact that the sales of autos dropped from over 4,000,000 in 1929 to 1,100,000 in 1932. There was no let-up in price, quality or sales appeal. As long as there is no co-ordinated industrial policy to establish prices that will continuously move full capacity production, each industry, for its own protection, must keep its prices as high as possible.

With a national purchasing power large enough to buy but 63 per cent of the goods our industrial equip-

ment can produce, there is a free race for the consumers' dollars, each contestant, using every trick of high pressure selling, strives to get the largest possible share of the limited purchasing power in return for the smallest possible value. The pari-mutuel racing industry is an example. Any producer or trade that can maintain a price structure more favorable than the average has a handicap in this race which is the most valued asset of the industry. It is hopeless to expect any group voluntarily to give up this advantage which has been won, in many cases, by expensive advertising and selling campaigns. It is foolhardy and hazardous for single industries to venture into the field of low prices.

Occasionally a shrewd producer may succeed, for a time, in remaining out of the trade association in his line, and obtain high volume by underselling his organized competitors. The high volume gives him low production cost and efficient distribution. The administered price for the industry is so high that the outsider can allow his price to be high enough to give him a good net profit. Conditions of this kind, however, cannot last long. The organized group, finding its market curtailed, will bring pressure to bear on the offender and by various methods force him out of business, take him into the group or meet his price. Meeting the lower price is, of course, socially desirable but experience shows us that this result occurs so infrequently that it cannot be relied on to correct the evils of scarcity and to halt the social unrest that is leading us to more complete state control. Government controls are now extensive and increasing rapidly. There is little hope that an unorganized industry can do anything to prevent government controls from attaining complete domination.

Co-operatives

The development of a strong co-operative movement which would furnish fair price yardsticks, might be a wholesome solution. Private industry can thrive on low competitive prices. The great value of co-operatives is the establishment of them. Lack of time before government controls embrace all business, however, rules them out as an effective cure although their promotion deserves full support.

The Government

That governments can set prices that will bring full employment is being proved in Italy, Germany and Russia. That this can be done without the establishment of an Ogpu or Gestapo with all their horrors is

less clear. It is also evident that government control would require great detail and therefore develop a tremendous bureaucracy. With bureaucratic price control there would be tremendous pressure to force the government to assume responsibility for losses on unsalable goods. The government, influenced as it is by pressure groups, would not easily find the correct definition of a fair price and there is grave danger that it might operate, as under NRA, to protect vested interests in unbalanced and inefficient production.

High taxes on high incomes are advocated by some as a means of preventing over-saving. Graduated income taxes are sound but rather uncertain as a source of revenue under the cycle economy. To use them for production control is placing production control in the hands of the government with all the consequent dangers. The high income tax plan has no factor to correct the evils arising from the fact that a part of our production is now competitive and the remainder administered which, as Dr. Hansen has said, creates a condition which cannot endure. We may need to accept government control of industry but if we do, we will lose precious liberties.

Co-ordinated Industrial Control

Authoritative representatives of all trade associations might form an over-all organization based on the fundamental truth that the amount that a relatively small owner group can collect for the use of the tools and organization of industry is dependent on and proportional to the prosperity of the masses served. Industry is trade and trade is exchange.

Industry cannot trade with a pauper neither can it trade with a subsistence farmer. It can profitably trade with a well paid industrial worker or with a commercial farmer. The industrialist must accept something owned or produced by his customer in exchange for the factory product. If the people exchange their tools, their homes or their land for autos or radios, as has too often been the case, they lose productivity and decrease their value as industrial customers. Trade is at its best when there is a fair exchange of current production. High pressure selling is not good long-pull strategy.

The owner group certainly cannot profit from the ownership of mass production equipment by making things for itself. The size of the industrial owner group is hard to determine but that it is relatively small is shown by statistics recently offered by the President to show that in 1929 three tenths of one per cent of the people received 78 per cent of all dividends paid to in-

dividuals who reported the receipt of dividends. (See article by Chas. R. Stevenson in Fall 1939 issue of *ADVANCED MANAGEMENT*.) There must be 35,000,000 cars on the road to support the automobile industry and with the automobile shops down, few of our other industries can show black figures. Mass production is only possible when it is supplying great quantities of goods and services to great numbers of people and this means great numbers of prosperous people.

As has been suggested above, there might possibly be a national trade or national industrial association. Such an association should announce as its fundamental objective the adoption of administrative policies that will bring about continued full employment and the maximum possible production of wanted goods and services. This objective should appear on all its literature and stationery and every act of the association should meet that test. To realize this objective such an association would need to prepare and conform to a code substantially like the following:

- a. Objectives: continued full capacity production of wanted goods and services.
- b. A uniform base wage scale.
- c. A uniform price making policy. All prices to be based on costs at full capacity production with mark ups as nearly uniform as possible. (Consideration must be given to variations in marketing costs but slight consideration should be given to the cost of high pressure selling.)
- d. The margin of prices above full capacity costs to be gradually lowered until 90 per cent to 95 per cent of the present unemployed are at work. (At this point full capacity production might be considered to have been attained.)
- e. Uniform accounting methods.
- f. Honesty in advertising.
- g. Strict rules governing deferred payment selling to be enforced. Interest rates on unpaid balances to be as low as possible. If sales drop due dates should be extended to keep outstanding obligations as near constant as possible.
- h. Goods produced and sold under this code to be so advertised and labeled.
- i. No penalty of any kind to be attached to selling at prices lower than those approved by the association.

This code is an attempt to outline the simplest possible working rules for American industry that will still attain the stated objective. Let those who think the rules too drastic cut them as much as they can without lessening our chance of reaching the objective. **Lip service**

to the idea of fuller output is not enough to sustain capitalistic economy.

The suggested national trade association would be composed of representatives of all present trade associations, the number of representatives from each association to be proportional to the total number of employees in each association. The voting members would elect a governing board or single administrator having authority similar to that of Judge Landis in baseball or Will Hayes in the motion picture industry. The national trade association would, if the proposed code were adopted, conform to all requirements of the antitrust laws and its meetings would at all times be open to the public which would include representatives of the government, organized labor and consumer groups.

The association would become effective as soon as the governing board was convinced that it had direct or indirect authority over enough production to make it safe. A publicity director should be promptly established as recent world history has proved that the establishment of an idea depends more on the publicity it gets than on its social soundness.

Our proposed association would require each trade association to submit a report of the total volume of business done in its line, the report to be broken down to the required detail of important items. Such information is now compiled by the various associations. A composite break-even chart of the industry and enough of the separate producing units to cover at least 65 per cent of the total production would be required. A comparison of the above reports would tell how far the various prices were out of line with the average, and the variations in the cost of distribution.

There would be public hearings at which the representatives of the various trade associations would strive to obtain relatively favorable price structures for their goods. The lumber people would be interested to see that the building industry would not be slowed down due to high costs of plumbing or electric wiring. The producers of household appliances would fight for low power rates to stimulate the demand for their product. Labor leaders would advocate low prices to convert standard wages into high real wages. The representatives of each industry would realize that low prices of all other goods would increase the market for their product. The government antitrust attorneys would be on the constant lookout to see that there were no combinations in restraint of trade. After the public hearings a report would be published giving adjustments

needed to equalize prices. On receipt of the above report each trade association would assume the responsibility for making the detailed price changes required to bring the average of the line to the national requirements. The plan could be put in operation with a small headquarters staff. After approved prices are equalized, the maximum prices authorized by the national association would be gradually lowered until full employment is attained.

Production at any given time is proportional to the man-hours of productive work, and the yearly product of the average productive worker in manufacturing sells for from six to eight thousand dollars. For each fabricating worker nearly two other workers are required in mining, transportation, trade service and miscellaneous work. The value turned out by the fabricating worker, if he is kept on the job, supports these other workers and leaves a margin for capital, management and taxes. The industrial productive payroll is the vital index; it is always proportional to the volume of goods in production, which is the volume purchased, so this payroll, with a constant wage rate, is the measure both of production and purchasing power. The slightest drop in productive payroll should be immediately followed by a price reduction.

It must be clearly understood that there will be no low limits on prices. All instructions would pertain to top prices. The only possible cause for objecting to low prices is the desire to protect some vested interest in supplying a limited market. Under the proposed plan there would be a constant demand for the full supply, removing this objection.

With full employment and full labor organization the requirement of a uniform base wage scale would to a large extent solve itself. With jobs for all no one would accept less than a standard wage.

Deferred payment selling has contributed to our lack of stability as the rate of purchases varies with the swing of the cycle. Excess purchases during the up swings could be reduced by shortening the payment time. Money available for new purchases could be increased by inserting a clause in all contracts allowing our proposed national trade association to increase due dates when purchases slacken. A constant flow of goods is needed.

Several critics of the plan proposed here have feared that it would force sales below costs. We must remember that all costs of production and distribution are lower at high production. No free economy can assure

that all goods will sell at any fixed price because some have a much greater customer appeal in proportion to costs than others. The approved maximum prices should be lowered only to the point which will sustain full employment production. With no low price limits the losses on the less desirable goods will be available for the purchase of the more desirable at above the average profit. No worthy rewards to enterprise and good judgment will be lost and keen competition will be obtained. The allowed mark up on the various classes of goods will depend on the relative cost of selling them efficiently, the various selling costs to be determined by our national trade association.

We hear much of the many new jobs created by new technology but the record shows that with an increase in the efficiency of production the worker gets a decreased opportunity to produce. This is one basic difficulty in our economy. That proper prices will cure the disease of unemployment is recognized in the pamphlet, "A Study of Depressions," recently issued by the National Association of Manufacturers under the names of nineteen leaders of industry who comprised the committee making the study. They state that one of the conditions necessary to sustained prosperity, once it has been achieved, is "Prices of agricultural, industrial, and commercial commodities, services and labor having such a relationship as will encourage sufficient buying and selling to provide steady employment for those willing and able to work."

This plan is submitted as a simple, direct and American way of realizing our objective of causing the two men actually to produce more.

The Compa-Ratio

(Continued from page 10)

It shows that the method of calculating the compa-ratio makes it independent of the size of the department or the variation in the number of positions. If a given department is increasing in size and has more personnel from one year to the next, the compa-ratio is not necessarily affected because it is a unit of comparison based on one hundred as standard cost.

TABLE IV

	1939—End of Quarters				1940—End of Quarters			
	1	2	3	4	1	2	3	4
Plant A. . . .	107.1	108.1	108.7	108.2	107.8	107.2	106.8	106.6
Plant B. . . .	102.3	102.4	102.9	103.1	103.1	103.3	104.0	104.7
Plant C. . . .	97.6	97.6	97.5	97.2	96.8	96.6	96.1	95.8
Plant D. . . .	101.0	101.2	101.1	101.4	101.4	101.6	101.9	102.0

(All figures are fictitious)

A SYSTEM OF NUMBERS FOR TIME STUDY ENGINEERS

By FRANK MASCARICH

Time Study Engineer

THE ability to write numbers rapidly and legibly is an important personal attribute in time study work. An analysis of the motions involved in writing arabic numbers discloses undesirable features which are inimical to the principles of motion economy. It is self-evident that any new system of numbers which is written with a minimum of departures from our present system and with fewer motions and changes in direction is more desirable for time study work. This conclusion leads to the following development:

CHART I

1 2 3 4 5 6 7 8 9 0
1 2 3 4 5 6 7 8 9 0

It now remains to prove that the adoption of this new system of numbers is justified by a reduction in the time of notation. Accordingly the following procedure was employed: The author practiced the new system for ten minutes and then wrote out ten columns of the conventional numbers (1, 2, 3, -) and noted the time; then a corresponding column of the new numbers was written out and the time recorded. This procedure was repeated for three pairs of columns to compose one test period. These periods were repeated five times, once every seven days. The results were then compiled and tabulated to compose:

CHART II

Run No.	1		2		3		4		5		Total
	Old	New	Old	New	Old	New	Old	New	Old	New	
1	.78	.73	.73	.68	.75	.62	.76	.60	.71	.56	
2	.79	.72	.73	.62	.70	.61	.72	.59	.70	.55	
3	.73	.68	.70	.64	.69	.60	.74	.57	.70	.54	
Total	2.30	2.13	2.16	1.94	2.14	1.83	2.22	1.76	2.11	1.65	10.93 9.31
Average	.767	.710	.720	.647	.713	.610	.740	.587	.704	.550	.728 .620
Diff.	.057		.073		.103		.153		.154		
% Improved	7.4%		10.1%		14.4%		20.7%		21.9%		

This chart shows that during five ten-minute practice periods a progressive improvement up to 22 per cent over the conventional method was attained. A similar test for the numbers most radically changed viz: 3, 4, 8, 9 registered an improvement of approximately 30 per cent. The simplicity of this system is borne out by the extent of improvement resulting from so little practice. It is significant that in alternate application of the old and new systems no confusion was experienced in writing characters of like meaning. As a matter of

fact, a slight progressive improvement in the old manner of writing was noticeable in the course of these tests.

This new system has been applied by the author in actual practice with good results. Whether or not it will prove as effective for time study engineers in general depends upon proper consideration of individual differences. In this connection it would be necessary to make extensive tests. This work is in process. I wish to point out that this development does not represent a final effort. Its main purpose is to stimulate comment and suggestion for evaluation of the present improved system or evolution of one still better. The prestige of the professional man depends in a sense on the tools and knowledge exclusively within his mental scope. It is my belief that the adoption of this or a similar system of numbers will add materially to the time study engineer's professional status.

WHAT'S WRONG WITH ACCOUNTING¹

A Reply

By EDWARD B. WILCOX

Partner, Edward Gore and Company,
Certified Public Accountants

IN A dual capacity of practicing independent certified public accountant and personal friend of Professor Billy E. Goetz, I attended a recent meeting of The Society for the Advancement of Management in Chicago to hear "What's Wrong with Accounting." As Professor Goetz listed his three damning charges, I bowed my head, and thought how I have sinned. But as he continued, the load of sin was lifted, and I was reminded of the tough hoodlum who, about to die, wanted to make confession. From his appearance, his sins must have been heavy. However, after much thought he murmured with his last breath, "I was disrespectful to my mother." The parallel is none too accurate. Public accountancy is not about to die, nor is it oppressed by a sense of wrong doing, but the sweeping indictments with which Professor Goetz compels the attention of his audience at the outset, are greatly moderated by the detailed discussion which follows. If, as he finds, there is nothing else to charge, then the accounting profession in this country may well

¹ This is a reply to Professor Goetz's article which appeared in the Fall, 1939, issue of ADVANCED MANAGEMENT.

hold up its head among erring mortals and imperfect human institutions.

No Bad Faith

Take note that Professor Goetz makes no indication or implication of bad faith on the part of accountants, or of greater attention to their own selfish interests than to their obligations and responsibilities. Accountants deal with matters which have little appeal to the emotions, and the habits of thought developed in their training are logical and objective. Typically, accountants are more interested in the soundness of their work than in its popularity, and they dread mistakes as some men dread rebuffs. This is why they are sometimes caricatured as cold and heartless. By training and acquired instinct accountants, with few exceptions, hew to the line as they see it, and let the chips fall where they may. Professor Goetz knows this, and does not attack accounting on any worse grounds than those of honest blundering. Apparently he thinks we are worth saving, and I take this as a silent tribute.

We are forgetful of our objectives, he says, and proceeds to list five of them. Here the blows begin to soften. We perform the first adequately, and the second reasonably well; we keep our eye on the third, and as to the fourth, we have done the only thing possible. Professor Goetz is no sycophant, but he does trust us with these four objectives, and this is praise of a sort. The full force of his condemnation comes with respect to the function of accounting as a tool of management. Strictly as a trading proposition, I would be willing to accept a measure of blame if it comes with four times as much praise, but I think we can go further than this. Desirable as it is that man shape his destiny, we cannot be so vain as to deny that we are to a great extent creatures of our environment. The environment which the accountant feels is in the form of requirements put upon him.

Since the Chiefs of Scribes kept records of transactions in early Egypt, there has been a demand for systematic methods of handling daily activities. This demand is dignified by antiquity, and has compelling force behind it. The requirements imposed by governments permit little, if any, choice. They also must be met. As to credit purposes, there is a vehement and articulate demand, amounting in recent years to a positive uproar, that might well excuse us for being deaf to all else. And even more important than all of these, in the eyes of the parties at interest, are the equities. Where, in all this babble of requirements, is the voice

of management demanding to be furnished with a tool? To my eagerly straining ear it has been, indeed, a still small voice.

Assistance to Management

Mitigating as these circumstances are, they fail, in themselves, to answer Professor Goetz's criticism that we do not furnish adequate assistance to management. My answer is that we can't and we do. We can't, first, because we aren't good enough salesmen, and I trust that this limitation will long remain with us. I do not mean to glory in a failure, but I dread the time when our profession may be sacrificed to the more glittering returns that will follow from the widespread adoption by its members of sales methods. Second, we can't because too small a proportion of management is competent to use even that which we are competent to furnish. How often are ridiculed the charts and graphs and daily reports which the very men who deride them refuse to read! Just as the falling tree in the forest produces no sound if there is no ear to hear it, so the tools which we can and sometimes do furnish to management, often turn uselessly in hands not able or willing to understand and use them.

Paradoxically, accounting does furnish management with an extension of hands, eyes, and ears to such an extent that it could only be appreciated if it were entirely removed. There is more about this in the last parts of Professor Goetz's paper which he, no doubt laughingly, calls constructive instead of critical. His penchant for criticism is too great to be downed. Under the head of "Planning," incidents are dramatized in which the accountant and the salesmen appear somewhat like the dumb stooges in a detective story, as a background for the brilliance of management. The implied generality that accountants can't or won't think straight, but that managers do, is not warranted by the facts in my experience. Neither is the thought that accountants seem obsessed with the notion that there are absolutes, and that they can only report facts. Accountants, at least practicing independent public accountants, have been shouting for years that there are no such things as absolutely accurate financial statements, and that accountants provide, not pure factual matter, but expert opinions. The best that I can propose as an alternate to the generality that accountants don't think straight is the rather unsatisfactory thought that some do and some don't. Professor Goetz's points are sound and admirably illustrated, but I believe it is fair to say that whether the solver of business problems be

in a managerial, accounting, or selling capacity, he arrives at sound and useful results, by applying straight thinking to accounting concepts. Stuart Chase has said, "Whenever a business becomes too large for one brain to handle personally, accounting takes over the job." The failure is not that we don't do it, but that we don't do it well enough or often enough, and I think Professor Goetz and I might define an area of agreement in the words of Browning: "Contrast the petty done; the undone vast."

Single Premise

I have one objection to the next item in the indictment of accounting. It is entitled, "Inaccurate Premises," and it should be singular instead of plural. The one inaccurate premise referred to is that the dollar is a fixed measure of value. I stand before the bar of commerce and admit that this premise is generally implicit in traditional accounting, and that, as Professor Goetz makes clear, it is unsound. Its effects are far reaching and they give rise to some material misconceptions. However, I am not ready to accept this fact as a criticism of accounting, but rather as a statement of one of its limitations. The time may come when this limitation will be transcended, but at the present time accounting is essentially a history in terms of money valuations. The use of the common unit of money for measuring dissimilar things seems too convenient to be readily discarded. This common unit could still be used even if resulting statements were adjusted so as actually to reflect another valuation basis, or group of other bases such as commodity indices. However, the adoption of such procedures would involve the education, not only of accountants, but also of that tremendous audience which reads, but all too little understands. I shudder to contemplate the transition period of misrepresentation and misunderstanding which would have to be gone through before such a change as this would become workable. In the meantime, I point with some gratification to the recent recognition by the Treasury Department of the Last-In-First-Out inventory method. This recognition was brought about, in part at least, by the persistent efforts of independent public accountants, and while it does not, by any means, correct the basic error in question, it is a step toward the mitigation of its effects.

We now come to those cruel words: "blundering logic." In titling all three of the counts in his indictment, Professor Goetz has used strong words, but in the details he has been moderate and therefore unassail-

able. Certainly he could have piled up many more inconsistencies than he has. The trouble lies in the multiple purposes of accounting, which, so far, we are required by public demand, to serve in a single set of financial statements. We are criticized by Professor Goetz for setting out discounts on purchases as non-operating income, but we have also been criticized by others for failing to show discounts not taken, as an expense. We are criticized for an analogy between purchase and sales discounts, but this analogy has been dropped to a considerable extent, largely at the instance of the Securities and Exchange Commission. We are criticized for a conventional form of analysis of increase or decrease in gross profit, which is admittedly imperfect. We have been reproached for omitting the much mooted leasehold liabilities from balance sheets, and for failing to recognize liabilities attendant on sales commitments. We might well have been attacked for the fundamental inconsistency that there is in compromising Balance Sheets and Surplus and Profit and Loss Accounts, so that they may appear to be consistent with one another instead of entirely independent.

There is no categorical answer to these criticisms. They are valid. Accountancy is an inexact science, and the preparation of financial statements is an art in which perfection is unattainable. The function of these statements, like that of language, is to convey an understanding from the writer to the reader. Statements must, first of all, be prepared in accordance with conventions which at least the informed reader understands. Internal or logical consistency must be sacrificed to this; otherwise the statements will not be understood. All the beautiful perfection of structure that can be obtained will not compensate for failure to achieve understanding. This does not mean that we are forever chained to whatever illogical conventions exist. It does mean, however, that we cannot move away from them any faster than we can carry ourselves and our audience. Accounting procedure is not and cannot be perfect. It is a growing and evolving thing, changing with changing conditions and requirements, but inevitably lagging behind them. Today, organizations of accountants are engaged in serious study and research, to find how these procedures can be improved without increasing conflicts of opinion among the writers and readers of financial statements. To move this vast body of myriad-minded accountants, bankers, stock exchange and government officials, and businessmen to the uniform acceptance of new conventions is a Herculean task. There is no wonder that independ-

ent and vigorous thinkers in the field such as Professor Goetz, are impatient with conservative adherence to established and widely accepted accounting practices.

Having considered in some detail what's wrong with accounting, it is now interesting to review the three charges named by Professor Goetz at the outset. These, he says, are serious charges. Any one would be fatal; the triad is damning. How to escape damnation in view of the convincing narrative which follows these charges, appears to be a task. The narrative is convincing, but does it support the charges? I submit that as they are drawn, it does not, but rather that it supports some milder ones as follows:

1. Incomplete attainment of objectives.
2. Retention of one traditional unsound premise.
3. Partial compromise of logic to accepted conventions.

These are not such serious charges. They are neither fatal nor damning, and even if others were added to them, they appear to add up to the conclusion that accounting is an imperfect thing in an imperfect world. Certainly this is recognized, and as long as that is so, and we continue to strive for improvement, we will be safe from the supreme tragedy of decadence.

REVIEWS

Reorganization of the National Government. By Lewis Meriam and Laurence F. Schmeckebier, The Brookings Institution, Washington, D. C., 1939, pages xii, 272. (\$2.00.)

Since this book was written, the Congress has passed the Reorganization Act of 1939, and the President has issued Reorganization Orders I and II, consolidating a number of New Deal agencies, and transferring other agencies to certain of the old departments, and from one department to another. Essentially, this book is a plea for delay in reorganization of the Federal Government. However, the Congress and the Administration have overruled the Brookings Institution.

This volume had the benefit of participation by the staff of the Institute for Government Research at Brookings, but it is essentially representative of the views that Lewis Meriam, of the Institution staff, has presented over the past few years. Brookings Institution has had a part in the discussion of reorganization, but in general, its views have not been accepted by the Government. Last year, it was Brookings that did most of the work for the Senate Committee headed by Senator Byrd, of Virginia. The purpose of that Committee was to reduce expenditures through limiting government function and reducing government activities. This book is interesting in that one gets

the general impression from it that such reduction is not to be accomplished by reorganization.

The authors divide the subject into an analysis of the problem and a brief history of reorganization efforts. Mr. Meriam writes the analysis, and Mr. Schmeckebier, the history. The analysis presents competently the various purposes that have been presented in proposals for Federal reorganization, and a discussion of the background and structure that determines reorganizational effort. In a discussion of curtailment of functions and activities, the author makes a vigorous plea for continued and careful observation of the division of powers in our National Government. He also presents very effectively the fact that no single reorganization will be of permanent value, that there must be continuous reorganization, and that our system of Government can be used to make continuous reorganization possible. His conclusions are concerned with what is necessary to make substantial reductions; what are the devices for economy; and, is a bill needed at this time. Mr. Meriam is of the view that excess personnel in the Government does not arise principally from overlapping. He thinks that there are unnecessary positions, and that staff is overloaded due to poor qualifications. In consequence, reorganization is not a method toward economy, nor does he think it is desirable at this time. The Congress and the Administration have decided definitely on the last point.

The latter half of the book, a brief history of reorganization efforts, is a very useful thing to any person concerned with the record of governmental development in the national structure, and that section alone makes the book one worth publishing. The section is brief, factual and competent. Not much opinion is presented in it.

Considering the book as a whole, one is struck by the fact that the concern of Brookings Institution seems to be solely that of curtailing functions. These are the questions that preoccupy Brookings: Who shall be responsible for decisions to curtail functions? What is necessary to make substantial reductions? How may we secure economy and efficiency? These are important questions. They deserve attention.

There are other questions equally important. How shall we be sure that Government performs all of the functions it should? How shall any functions assumed by Government be taken on most efficiently? How can we be sure that Government expands its functions to meet serious needs? These are equally important, and it would be fortunate if Brookings Institution would direct equally careful attention to them.

It would also be useful if we might have further study of the sort indicated in part of the analysis in this volume as to basic constitutional and organizational questions in our governmental structure. Is the three-way division of powers too rigid? Can the responsibility and authority of Congress and the President both be enlarged without merger? Are their fields where they both should be enlarged and merged?

What is most necessary in administration is that it shall be consistent. A well-organized merit system can be expected to give us consistency of ability and performance, but over and above that, we need consistency of policy and plan. Re-distribution of functions may make consistency attainable, but it will not give us assurance of it. There is still room for a good book in the field. Reviewed by JACOB BAKER, President, United Federal Workers of America, Washington, D. C.

Manual for Executives and Foremen. By Erwin H. Schell and Frank F. Gilmore, McGraw-Hill Book Company, New York, 1939, pages ix, 185. (\$2.00.)

The authors of this manual evidently assume that no plant supervisor can long hold his job unless he constantly increases his technical proficiency. They have endeavored to provide factory executives and foremen with a job-insurance policy. This policy takes the form of a series of eleven lessons on the various techniques of industrial management.

Each lesson, or chapter of the manual, suggests an appropriate procedure for conducting intensive research projects with the view to increasing efficiency and economy of operations. For example, in the study of materials-handling the authors suggest that the plant department head make a scale drawing of his department including all fixtures and machinery and then proceed to rearrange the machinery in such ways as to obtain a layout necessitating the least trucking. The next step would be to arrive at a layout whereby all trucking would be eliminated by substituting conveyors or other mechanical means.

Scores of similar projects are suggested on the supposition that the best way to keep in step with "advancing technical and managerial methods" is through individual experimentation and personal study of the supervisor's operating problems. Of course, to carry out any considerable number of the projects without seriously neglecting current supervisory responsibilities would require years of time. That is what the authors evidently expect. They ask the reader to work with their manual from chapter to chapter and procedure to procedure. They want him to use it as the druggist would use his pharmacopoeia and the traveler his guide-book. It is certainly an invaluable manual for these purposes. But one wonders whether the typical plant supervisor can really find a sure fire guide to promotion in devoting so much time and effort to technical studies.

If the ideal supervisor is a person who is most adept at the art of leadership and if the ideal plant manager is one who can effectively delegate and organize work rather than master all the arts, crafts and professions required for the operation of a modern industrial enterprise, it is quite possible that any individuals who conscientiously apply themselves to mastery of all the techniques suggested by the authors may lose out in the competitive struggle for advancement or even for retention in their present jobs. Reviewed by RUSSELL L. GREENMAN, McKinsey & Company, New York.

Public Personnel Problems, From the Standpoint of the Operating Officer. By Lewis Meriam, The Brookings Institution, Washington, D. C., pages xii, 440. (\$3.00.)

Mr. Meriam's latest book is built around an idea too often overlooked in the literature of public personnel administration: that "only a relatively small part of the real personnel work of" an operating "office falls within the jurisdiction of" the central control agency, such as the Civil Service Commission. Indeed, even in those matters—chiefly new appointments and salary classifications—the career operating man is apt to have some sound ideas which the personnel agency might well take into account.

It is to encourage these administrative officers that this book is written. It does not pretend to deal with details of personnel technique in the jargon of the trade; and it seeks to make its points with homely illustrations of situations and human problems that Mr. Meriam has seen in his long experience in and around the Federal Government—first in the Census Bureau, then in the newly organized Children's Bureau, then in his many years of observation from the vantage point of the Brookings Institution, where he is now chairman of the Institute for Government Research. Mr. Meriam accordingly devotes not too much space to selection of employees and testing, but, in a balanced way, treats of all the aspects of personnel problems with which the operating officer will be confronted: salary fixing, working conditions, sick leave, safety, retirement, morale and discipline, employee unions, political activity. Throughout, the discussion is practical, realistic and helpful.

The last three chapters deal with broader and more philosophical questions: how distinguish between "policy-making" and "administration"? What is the best education for a "career service" in administration—whatever that is? Is a civil service commission better than a single personnel administrator? Here Mr. Meriam restates for the operating official points of view which have long been associated with his name, and on which he has written previously: he disarms the critic in his introduction by conceding that "one cannot escape certain personal convictions, or perhaps, prejudices." At least he has stated his convictions cogently. One may differ upon some of these convictions, and still attest the usefulness of Mr. Meriam's book for the purposes intended. Reviewed by CHARLES S. ASCHER, Secretary, Committee on Public Administration, Social Science Research Council, New York.

Office Management. By John H. MacDonald, Prentice-Hall, Inc., Publishers, pages xx, 599. (\$4.00.)

Practical Office Management, The Correlation of Men, Methods, and Machines. By Harry L. Wylie, Merle P. Gamber, and Robert P. Brecht, Prentice-Hall, Inc., Publishers, pages xxiii, 300. (\$5.00.)

The field of office management has increased in importance so much in the last few decades that both of these books speak of the profession of office management. Each of them treats a wide variety of subjects, apparently attempting to touch upon all the major matters with which an office manager should be familiar. This treatment makes evident the wide range of knowledge which a professional office manager should have, and it indicates the relationships between various aspects of the work. Either book should be helpful to a person entering the field or to one in it who has not thoroughly studied the literature of office management. The person in charge of a large office will need to go much further into many specialized fields than could be covered in a single book. Neither book deals with white collar labor organization, which may bring new and difficult problems in office management in the coming years. "Office Management" gives a short bibliography; "Practical Office Management" gives none. Both books would be more helpful if they had extensive bibliographies.

"Office Management" is a revised edition of a book by the same title published in 1927, and is about twice as long. Each

of the original chapters has been expanded and new chapters added on miscellaneous personnel activities and on supervision of office employees. Many more illustrations are given in text or figure form. Much material has been quoted from a wide variety of sources, and often the varying views of office managers are presented; for instance, the advantages and the disadvantages of centralized stenographic service.

"Practical Office Management" covers about the same field as "Office Management" but does so in half the space. It has far fewer detailed illustrations and tends to be somewhat more philosophical. It gives relatively more space to personnel problems, but it is not sufficiently detailed to be a text on personnel administration. Sometimes it seems rather too definite; for instance, in its unqualified advocacy of centralized service units. "The secondary services are the stenographic, typing, duplicating, calculating, and so on. These secondary services are most effective when centralized." (page 32.) "It is economical, because the total number of typists required in a central unit is less than if the typists were located in individual departments." (page 187.) No mention is made of the size of the organization, the technical or specialized aspects of the work and its volume and evenness of flow, as important considerations in determining whether the advantages of centralization outweigh its disadvantages. Some companies find that centralization of part and not all of the work is desirable and others have secured better service with fewer typists after a centralized department was broken up.

"Practical Office Management" ends with an interesting three and a half page quotation from Fénelon, a French author writing around 1700. Mentor outlines the duties of a king in words which should prove helpful to business executives today. The quotation starts:

"Idomeneus," continued Mentor, "is by no means deficient, either in penetration or knowledge; but he wastes his abilities upon little things; he is too much busied upon parts to comprehend the whole, and he arranges atoms, instead of conceiving a system. The proof of abilities in a king, as the supreme governor of others, does not consist in doing everything himself; to attempt it is a poor ambition; and to suppose that others will believe it can be done, an idle hope." Reviewed by HENRY E. NILES and M. C. H. NILES, Consultants in Management, Baltimore, Md.

Group Purchase of Medical Care by Industrial Employees. By Leahmae Brown, Industrial Relations Section, Princeton University, pages 53.

This report based on material collected by the Industrial Relations Section of Princeton University deals with the necessity of development of effective remedies for the Industrial Wage Earner to meet the problem of adequate medical care and loss of earnings due to disability sickness, pointing out that this must be done through private initiative since government and organized labor have scarcely touched the problem.

Regarding the problem of medical care, the report points out that medical expenses and loss of wages of workers receiving less than \$2500 a year amounts to some 6 per cent of their annual income. Among this class of workers outlay for medical service is controlled by ability to pay, rather than the need for

care. Industry has a definite interest in the problem of sickness because of financial loss due to labor turnover and impaired efficiency.

Recommendations of the committee on the costs of medical care, organized in 1927 to consider the economic phases of medicine and to suggest plans of action, include group medicine, extension of public health services and the distribution of the cost of medical care by means of insurance, taxation, or both.

Chapter II deals with the "Developments in General Medical Care Within Industry" and covers briefly the following fields: A. Industrial Medical Departments; B. Mutual Benefit Associations; C. Company Plans for the Group Payment of Medical Care, and D. Group Hospitalization Plans.

Covering the attitude of organized medicine toward group purchase plans, the report indicates that through its spokesman, The American Medical Association, organized medicine has opposed group purchase plans on the following points: 1. Curtailment of freedom of choice of physicians; 2. Lack of personal relationship between physician and patient; 3. Fear of lay control of medical practice, and 4. Dangers inherent in contract practice.

The main part of the report is devoted to a summary of "Representative Plans for Group Purchase of Medical Care by Industrial Employees," outlining and analyzing plans in force in the following companies as illustrative of different methods of financing, administration, and operation: A. Allis-Chalmers Manufacturing Company; B. Spaulding Bakeries, Inc.; C. Standard Oil Company of Louisiana; D. Union Oil Company of California; E. Standard Oil Company (New Jersey) and its subsidiary, East Ohio Gas Co., and F. Federal Home Loan Bank Board.

The summary points out that circumstances in each case must determine the type of plan to be adopted and that no one plan can be presented as a model. In general, however, as complete service as possible should be offered. Plans should be employee administered—with physicians responsible only to members of the association. Above all else, the important point stressed is the need for friendly labor relations before such a plan can be expected to succeed. Too often, employers adopt plans of this kind in the hope of cementing employee relations when in reality the cause of grievance and dissatisfaction has not been corrected. The primary requisite for success of this type of plan as in any industrial relations activity is confidence and friendly co-operation between employer and employee.

The future development of medical service plans cannot be predicted but should national measures be taken it is intimated that existing plans may be continued in supplement, as in the case of private pension and dismissal wage plans now supplementing the Federal Social Security Act.

The report contains a selected bibliography which together with the material presented in the report itself should be a valuable guide for those interested in the adoption or operation of a group plan for medical care, for in this, as in their other studies, the Industrial Relations Section of Princeton University has done a splendid job of presenting factual material gleaned from a careful and exhaustive survey of the field. Reviewed by MARGUERITE HICKS, Group Department, The Equitable Life Assurance Society of the United States, New York.

